Journal of Medical and Biomedical Sciences (2021) 8(1):1– 7
 ISSN 2026-6294

ORIGINAL ARTICLE

Evaluation of Care of The Newborn Immediately after Caesarean Section Delivery at the Tamale Teaching Hospital

Alhassan Abdul-Mumin[1,2] Solomon Dawuni[3] and Jeff Peters[2,3]

[1]Department of Pediatrics and Child Health, School of Medicine and Health Sciences, University for Development Studies; [2]Tamale Teaching Hospital; [3]Department of Anesthesiology and Intensive Care, School of Medicine and Health Sciences, University for Development Studies.

Majority of neonatal deaths that occur in the first day of life could be prevented by the presence of a skilled attendant at birth. This is however lacking in many instances. In this prospective, cross-sectional study, health care providers attending Caesarian deliveries were covertly evaluated by using scheduled proforma designed based on standard practice guidelines. Six enumerators were assigned from 1st May-31st May,2017 to observe the practice of the providers from setting up of trolley to the tenth minute post-delivery. Actions and omissions of vital procedures were entered onto the proforma. Forty-one **(**41) providers were observed in successive Caesarean deliveries during the study period. In 68% of deliveries the baby cried immediately after birth. About 80% of providers didn't scrub before receiving the baby. Resuscitation equipment was pretested in 97.6% of cases and all babies were dried immediately. Immediate skin to skin with mother was done in 7.3% and delayed cord clamping in 21.9% of deliveries. In assessing the APGAR score, 44% didn't check the heart rate and 82.9% didn't check reflex irritability. This study revealed gaps in the care of newborns immediately after Caesarean delivery. Measures should be put in place to rectify them to improve quality of care.

Journal of Medical and Biomedical Sciences (2021) 8(1), 1 - 7

Keywords: Newborn, Immediate care, Caesarian delivery, Newborn resuscitation

INTRODUCTION

Newborn deaths now account for almost half of deaths in children under five years in many Low and Middle-Income Countries (Liu *et al.,* 2016; UN and UNICEF/WHO, 2019). Most of these deaths occur on the day of birth up to the end of the first week of life and are generally attributable to avoidable factors such as birth asphyxia, preterm birth complications and infections (Lawn *et al.,* 2014; Sankar *et al.,* 2016). Hospital-based deliveries increase the difficulties of transition for many neonates because of the frequent use of Caesarean section (C/S) deliveries, before the onset of labor, early cord clamping and the use of anesthetic and analgesics associated with surgical deliveries (Hillman *et al.,* 2012). The transitional difficulties and complications lead to neonatal developmental problems and deaths (Fraser, 2002). Most of these mortalities are attributable in part to inappropriate practices and inadequate resources (UNICEF, 2018). Several of these complications can be reduced by the presence of a skilled birth attendant at delivery. The complications that occur at birth differ by mode of delivery. Babies delivered by C/S are at risk of lacerations, transient tachypnea, early separation from mother causing less bonding and late initiation of breast-feeding, exposure to anesthetic medications and persistent pulmonary hypertension (McCullouch, 2018). In low-risk pregnancies, neonatal mortality rates are higher in babies delivered by C/S than that of spontaneous

Correspondence: *Alhassan Abdul-Mumin: Department of Pediatrics and Child Health, School of Medicine and Health Sciences, University for Development Studies;*
Email- amalhassan@uds.edu.gh

vaginal delivery (MacDorman *et al.*, 2006).

Efforts aimed at initiating or improving good practices in the delivery rooms in the critical period during and immediately after childbirth appear not to be yielding sufficient results, especially, in most countries in sub-Saharan Africa (Mannava *et al.,* 2015).

Improved care for pregnant women during the peripartum and early newborn period could significantly reduce neonatal mortality (Makene *et al.,* 2014). Despite the existence of proven interventions for these purposes, a lot of gaps still exist globally regarding the care provided during this period (Kassar *et al.,* 2013; Makene *et al.,* 2014).

The aim of this single center prospective cross-sectional study was to document the care provided by health care providers immediately following C/S delivery in a tertiary hospital in the Northern region of Ghana.

METHODOLOGY

Setting and participants

This prospective cross-sectional study was conducted in the Obstetrics and Gynecology Department of the Tamale Teaching Hospital (TTH) from 1st May to 31st May, 2017. The hospital is an 800-bed capacity facility serving as the only teaching hospital in the Northern part of Ghana. It serves as the center for clinical training of medical students from the School of Medicine and Health Sciences of the University for Development Studies, Tamale, Ghana. Its main catchment area includes the Northern, Savannah, North East, Upper East and Upper West regions with population of more than 4 million people. The Obstetrics and Gynecology Department provides advanced care for women with obstetric and gynecological conditions and has a bed-capacity of 170. In 2017 about 30% of the 7859 deliveries in the department was by C/S (TTH 2017 Annual Review, unpublished). At every C/S delivery, one health care provider (midwife/general nurse) is assigned to receive and provide care for the newborn immediately after delivery.

The participants for this study were conveniently sampled to include all the nurses/midwives (here referred to as healthcare providers) assigned to receive and cater for the babies. A total of 41 C/S deliveries involving the participants were observed in this manner during the study period. Each participant was observed for only one delivery. Due to the covert nature of the study, the specific ranks, ages and years of work of the participants were not captured.

Data collection procedure

A proforma was used in recording information. This was designed based on standard practice guidelines for the care of the newborn immediately after birth (WHO, 2012; Weiner *et al.*, 2016). Research assistants were trained to observe the health care provider assigned to receive the baby. Being part of the surgical team made the work of the research assistants simple and easy. During data collection these assistants were able to do their observation at the blind side of all the health care providers. This specific method was chosen in order to ascertain the practical and true reflection of the care provided. The research assistants were changed from time to time to avert any suspicion. These observations were terminated at 10 minutes after birth by which time most of the major immediate care and evaluation of the baby would have finished. The main processes observed were preparation made by the provider before baby is born, steps followed in providing care immediately after birth and assignment of the APGAR (Appearance, Pulse, Grimace, Activity and Respiratory effort) score. Performance and non-performance of the expected procedures/ steps was documented. Items on the proforma were evaluated by a pediatrician and an anesthesiologist and found to be context valid.

Ethical Consideration

Permission to conduct this study was granted by the Research and Development Department of the TTH. No personal identifiers of the participants were documented as part of this study. The principal investigator guaranteed that information obtained were maintained confidential.

Data Analysis and Presentation
All data was entered into the Statistical Package for Social Sciences (SPSS) software package (version 20) for data analysis. Simple descriptive statistics such as counts and percentages were performed and the results presented as tables.

RESULTS

Indications for C/S delivery
Table 1 shows the various indications for C/S deliveries during the study period. Fetal distress (19.7%), elective C/S (18%) and previous C/S (16.4%) were the most common indications documented.
Steps taken by Health care provider in care of the newborn after C/S delivery
Only 8 (19.5%) participants scrubbed their hands before receiving babies while about 40 (97.6%) pretested resuscitation equipment before delivery of baby. Delayed cord clamping was practiced by 9 (21.9%) participants.
Immediate skin-to-skin placement of baby and mother was only done by 3 (7.3%) of participants. Table 2 shows details of the practices by participants.

Steps taken in assessment of the APGAR score
The APGAR score, when assessed properly, provides information about the condition of the baby at birth. More than half (26, 63.4%) of the participants checked the respiratory rate of the newborns within the first minute of life by observing chest movements. About 1/3 (29.3%) didn't do any respiratory assessment.
Regarding the other steps taken during the assessment, majority (82.9%) of the participants did not assess for reflex irritability, only 53% assessed the heart rate when assigning the APGAR score and a timer was not used by majority (84.3)

Table 1: Indications for Caesarean section deliveries.

Variable	Frequency
Abruption placenta	8 (13.1%)
Fetal distress	12 (19.7%)
Eclampsia	6 (9.8%)
Breech presentation	4 (6.6%)
Severe Oligohydraminos	6 (9.8%)
Previous C/S	10 (16.4%)
Elective	11 (18.0%)
Large baby	4 (6.6%)
Total*	**61 (100)**

*The sum is more than 41 because some patients had more than one indication

Table 2: Steps taken by health care providers in newborn care after Caesarean section

Activity	Yes	No
Midwife scrubbed for the procedure	8 (19.5%)	33 (80.5%)
Resuscitation equipment available and pretested	40 (97.6%)	1(2.4%)
Mouth and nose wiped after delivery	39 (95.1%)	2 (4.9%)
Baby cried immediately	28 (68.3%)	13 (31.7%)
Delayed cord clamping	9(21.9%)	32(78.1%)
Wiping and drying of the baby immediately done	41(100%)	0(0%)
Skin-to-skin place-ment of the newborn	3(7.3%)	38(92.7%)

Table 3: Steps taken by health care providers in assessment of the APGAR

APGAR assessment	Frequency
Methods in assessing respiration	
Observing chest movement	26 (63.4%)
Auscultating lungs	3 (7.3%)
Not assessed	12 (29.3%)
Methods in cardiac assessment	
Palpation of cord	22(53.7%)
Auscultation for heart rate	1 (2.4%)
Not assessed	18 (43.9%)

of participants during the process. Table 3 shows details of steps taken in assessing the APGAR score.

DISCUSSION

The Newborn Resuscitation Program recommends an algorithm to follow for the care of babies either delivered vaginally or by C/S. This includes the presence of at least one skilled attendant, preparation of delivery room or operating room, controlling checklist of equipment and pretesting them and washing of hands, then wearing of sterile gloves to receive baby (Wyckoff et al., 2015; Weiner *et al.*, 2016).

One of the key steps in this process is proper hand washing and wearing of sterile gloves in readiness to receive the baby. This step was not adhered to by 4 out of every 5 participants in our study. This is contrary to the 2015 Newborn infection prevention and management guidelines (USAID, 2015). This breach could lead to transfer of infections from providers to the newborn. Studies have shown an improvement in newborn survival with proper hand hygiene by both mother and health care provider (Wisner and Cocoman, 2017).

The practice of wiping the mouth and nose and drying babies immediately after delivery was in accordance with standard practice guidelines (WHO, 2012; Weiner *et al.*, 2016). However, the warm chain was most likely broken by participants as most of them (95%) omitted the important step of placing baby skin-to-skin with mother immediately after delivery and continuing for the first 90 minutes of life (Lunze *et al.,* 2013). Maintaining the warm chain throughout the continuum of care is important in reducing risk of hypothermia which can happen in every climate and lead to adverse outcomes including death (Kumar *et al.,* 2009).

C/S delivery in itself is not a contraindication to early initiation of skin-to-skin care but a number of barriers have been identified over the years that can be surmounted with multi-disciplinary team involvement in the operating room (Stevens *et al.,* 2013; Elsaharty and McConachie, 2017).

WHO recommends delayed cord clamping for at least one minute as it reduces the risk of anemia and blood transfusions in the first 6 months of life and reduces risk of intracranial bleeding in especially preterm babies (WHO, 2014). This will be essential in the Northern region of Ghana where more than 80% of children under 5 years have some form of anemia (Ewusie *et al.,* 2014). However, practice rates vary according to jurisdictions and mode of delivery. In Caesarean deliveries it may be affected by the condition of mother, baby or both of them, especially when baby needs resuscitation (WHO, 2014; Phillip and Saigal, 2004). In our study more than 60% of the babies cried immediately after birth and did not need intervention, so this could not be the only factor leading to the low adherence (21.9%) to this practice.

The APGAR score has been used over the years to assess the condition of the baby at birth, albeit with some controversies, partly due to its mainly subjective nature and non-consideration of resuscitative measures following birth (AAP and ACOG, 2015; Iliodromiti *et al.*, 2014). In this study, the pulse rate and respiratory rate were two components of the score that were commonly assessed by providers but reflex irritability and muscle tone were rarely assessed. This is despite the fact that every baby was assigned a score at the end of assessment. This can be problematic in our environment where we depend heavily on the APGAR score to diagnose birth asphyxia.

Overall, adherence to steps in essential newborn care following Caesarian delivery in this study was low. This reflects the global challenge of disparities between what is proven to work and the care the patient actually receives.

Previous studies have identified health workforce performance as key bottleneck for both basic newborn care and neonatal resuscitation in Africa (Enweronu-Laryea *et al.*, 2015) and low quality of routine and emergency perinatal care in some facilities in Ghana (Nesbitt *et al.,* 2013). Further studies will be required to assess knowledge and attitudes of our providers in this regard. This could then serve as a guide for planning of interventions to improve care provided in our institution in this critical period. Our institution is currently involved in a multicenter quality improvement project aimed at improving skills of perinatal care providers which

we hope in the long run will contribute to improved care.

The study was not without limitations. The covert nature of the study made it difficult to identify participants by their qualifications and years of experience which information could be vital in interpreting the findings of the study. As a single center study, the findings may not be generalizable to practices in other jurisdictions. Despite these limitations, the findings revealed significant lapses in the care of the newborn immediately after birth and this could guide institutional policies to improve newborn care practices.

CONCLUSION

In this study, we observed several gaps in the care provided to newborns immediately after Caesarian delivery including non-adherence to hand washing, delayed cord clamping and assessment of the APGAR score. Further studies on knowledge, attitude and practices are required to ascertain reasons behind these lapses. This will then guide institutional policies and interventions to improve care during this critical period.

Acknowledgement: We thank the staff of the Obstetrics Theatre, of TTH for their support and cooperation during the data collection

Conflict of interest: None to declare.

REFERENCES

American Academy of Pediatrics Committee on the Fetus and Newborn and American College of Obstetricians and Gynecologists Com mittee on Obstetric Practice. (2015). *The APGAR score.* Pediatrics 136(4): 819-822.

Askin, D.F. (2002). Complications in the transition from fetal to neonatal life. *Journal of Obstetric, gynecologic and Neonatal Nursing* 31(3):318-27.

Elsaharty, A.and McConachie, I.(2017).Skin to skin: A modern approach to caesarean delivery. *J Obstet Anaesth Crit Care* 7:13 - 9.

Enweronu-Laryea, C.,Dickson, K.E., Moxon, S.G., Simen-Kapeu, A., Nyange, C., Niermeyer, S., Bégin, F., Sobel, H.L., Lee, A.C.C., von Xylander, S.R. and Lawn, J.E. (2015). Basic newborn care and neonatal resuscitation: a multi-country analysis of health system bottlenecks and potential solutions. BMC *Pregnancy Childbirth* 15: S4.

Ewusie, J.E., Ahiadeke, C., Beyene, J. and Hamid, J. (2014) Prevalence of anemia among under 5 children in the Ghanaian population: estimates from the Ghana demographic and health survey. *BMC Public Health* 14, 626.

Hillman, N., Kallapur, S.G. and Jobe, A. (2012). Physiology of transition from intrauterine to extrauterine Life. *Clin Perinatol* 39 (4):769-783.

Iliodromiti, S., Mackay, D.F., Smith, G.C., Pell, J.P. and Nelson, S.M. (2014). Apgar score and the risk of cause-specific infant mortality: a population-based cohort study. *Lancet* 384(9956): 1749-55.

Kassar, S.B., Melo, A.M.C., Coutinho, S.B., Lima, M.C. and Lira, P.I.C. (2013). Determinants of neonatal death with emphasis on health care during pregnancy, childbirth and reproductive history. *Journal of Pediatrics* 89;269-277.

Kumar, V., Shearer, J.C., Kumar, A. and Darmstadt, G.L. (2009) Neonatal hypothermia in low resource settings: a review. *Journal of Perinatology* 29: 401 - 412.

Lawn, J. E., Blencowe, H., Oza, S., You, D., Lee, A. C., Waiswa, P., Lalli, M., Bhutta, Z., Barros, A. J., Christian, P., Mathers, C., Cousens, S. N. and Lancet Every New born Study Group. (2014). Every New born: progress, priorities, and potential beyond survival. *Lancet* 384(9938): 189–205.

Liu, L., Oza, S., Hogan, D., Chu, Y., Perin, J., Zhu, J., Lawn, J. E., Cousens, S., Mathers, C., and Black, R. E. (2016). Global, regional, and national causes of under-5 mortality I n 2000-15: an updated systematic analysis

with implications for the Sustainable Development Goals. *Lancet* 388(10063): 3027–3035.

Lunze, K., Bloom, D.E., Jamison, D.T. and Hamer, D.H. (2013).The global burden of neonatal hypothermia: systematic review of a major challenge for newborn survival. *BMC Medicine* 11:24.

MacDorman, M.F, Declercg, E., Menacker, F. and Malloy, M.H. (2006). Infant and neonatal mortality for primary cesarean and vaginal births to women with "no indicated risk," *United States, 1998-2001 birth cohorts. Birth* 33(3) 175-82.

McCulloch, S. (2018). What Are the Risks of C-Section For A Baby? *Retrieved from www.bellybelly.com.au/birth/risks-of c - section for baby.*

Makene, C.L., Plotkin, M., Currie, S., Bishanga, D.,Ugwi, P., Louis, H.,Winani, K. and Nelson, B.D. (2014). Improvements in newborn care and newborn resuscitation following a quality improvement program at scale: results from a before and after study in Tanzania. *BMC Pregnancy Child birth* 14, 381.

Mannava, P., Durrant, K., Fisher, J., Chersich, M., and Luchters, S. (2015). Attitudes and behaviours of maternal health care providers in interactions with clients: a systematic review. *Global Health* 11:36.

Nesbitt, R.C., Lohela, T.J., Manu, A., Vesel, L., Oy ere, E., Edmond, K., Owusu-Agyei S, Kirkwood B.R, and Gabrysch, S. (2013). Quality along the Continuum: A Health Facility Assessment of Intrapartum and Postnatal Care in Ghana. *PLOS ONE* 10 (10).

Philip, A.G.S. and Saigal, S.(2004).When Should We Clamp the Umbilical Cord? *NeoReviews* 5:4.

Sankar, M. J., Natarajan, C. K., Das, R. R., Agarwal, R., Chandrasekaran, A., and Paul, V. K. (2016). When do newborns die? A systematic review of timing of overall and cause-specific neonatal deaths in developing countries. *Journal of perinatology* 36 Suppl 1: S1–S11.

Stevens, J., Schmied, V., Burns, E and Dahlen, H. (2014). Immediate or early skin-to-skin contact after a Caesarean section: a review of the literature. *Maternal and Child Nutrition* 10: 456–473.

UN., UNICEF and WHO. (2019). United Nations Inter-agency Group for Child Mortality Estimation (UNIGME); *Levels and Trends in child mortality*. New York.

USAID. (2015).Newborn Infection Prevention and Management. *retrieved from https://www.mcsprogram.org/our-work/newborn-health/newborn-infection-prevention-management* .

Weiner, G. M., Zaichkin, J., Kattwinkel, J., American Academy of Pediatrics, and American Heart Association. (2016). *Textbook of neonatal resuscitation 7th edition. American Academy of Pediatrics,* Elk Grove Village, Illinois, USA.

Wisner, L. and Cocoman, O. Every Newborn Ac tion Plan 2017 Report: Celebrating Every Birth & Ending Preventable Deaths. MSCP. *retrieved from https://www.mcsprogram.org/every newborn action plan-2017 report celebrating every birth ending preventable deaths. accessed* 15/05/2017.

World Health Organization. (2012). Guidelines on basic newborn resuscitation. *Retrieved from https://www.who.int/maternal child adolescent/documents/ basic newborn resuscitation/en.*

World Health Organization. (2014). Guide line:.Delayed umbilical cord clamping for Improved maternal and infant health and nutrition outcomes. Geneva: *World Health Organization.*

Wyckoff, M.H., Aziz, K., Escobedo, M.B., Kapa dia, V.S., Kattwinkel, J., Perlman, J.M., Simon, WM., Weiner, G.M. and Zaich kin, J.G. (2015). Part 13: neonatal

resuscitation: 2015 *American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation 132* (suppl 2): S543–S560.

ISSN 2026-6294