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Original Research Article

The Predictive Value of the American Society of Anesthesiologists Physical Status Classification System for Therapeutic Outcomes in Emergency Cesarean Section at Douala General Hospital, Cameroon

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Abstract: ***Background***: The American Society of Anesthesiologists (ASA) Physical Status classification is a critical preoperative risk assessment tool. Its predictive utility for outcomes in the high-acuity, resource-constrained environment of an emergency surgical setting, such as for emergency Cesarean Section (CS) in Sub-Saharan Africa (SSA), requires validation. This study aimed to evaluate the correlation between the ASA status score and the therapeutic outcomes (maternal and neonatal) of patients undergoing emergency CS at Douala General Hospital (DGH). ***Methods*:** This was a single-center, prospective, descriptive cohort study conducted on 36 consecutive patients who underwent emergency CS at DGH from January 2024 to July 2025. Patients were stratified into ASA physical status categories I to III based on preoperative assessment. Data collected included demographics, CS indications, intraoperative complications (e.g., hemorrhage, hemodynamic instability), postoperative maternal outcomes (ICU admission, length of stay), and neonatal outcomes (Apgar scores, resuscitation needs). Statistical analysis used ANOVA and Chi-square tests, with $p<0.05$ considered significant. ***Results*:** The mean age was 28.5±5.2 years. The cohort comprised 13.9% ASA I, 61.1% ASA II, and 25.0% ASA III patients. Fetal distress (41.7%) was the leading indication, followed by severe pre-eclampsia/eclampsia (22.2%), which heavily drove the ASA III classification. A higher ASA score significantly correlated with worse outcomes. ASA III patients had a significantly longer mean hospital stay (8.5±2.8 days vs. 6.5±2.0 days for ASA II, $p<0.05$), higher incidence of hemodynamic instability (55.6% vs. 13.6% for ASA II, $p<0.01$), and were the only group requiring postoperative ICU admission (22.2%, $p=0.03$). Neonates of ASA III mothers had significantly lower 5-minute Apgar scores (6.8±1.6, $p<0.01$) and higher NICU admission rates (55.6%, $p<0.01$). ***Conclusion*:** The ASA physical status classification is a robust, practical, and predictive tool for therapeutic outcomes in emergency CS in this SSA setting. A higher ASA score accurately identifies patients at significantly increased risk of severe maternal and neonatal morbidity. These findings affirm the score's critical role in rapid risk stratification, guiding resource allocation, and optimizing care pathways at DGH and similar resource-limited hospitals.

Keywords: ASA Score, Emergency Cesarean Section, Maternal Morbidity, Neonatal Outcome, Risk Stratification, Sub-Saharan Africa, Anesthesia.

1. INTRODUCTION

The American Society of Anesthesiologists (ASA) Physical Status classification system, established in 1941, remains the most widely recognized tool globally for evaluating a patient's preoperative health and stratifying perioperative risk [1, 2]. While the score itself is a simple ordinal categorization of systemic disease, its widespread adoption stems from its

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consistent ability to correlate with operative mortality and morbidity across diverse surgical populations [3, 4]. Obstetric surgery, particularly emergency Cesarean Section (CS), presents a unique challenge to risk stratification. The need for immediate intervention, often driven by acute, life-threatening conditions such as severe hemorrhage, placental abruption, or severe pre-eclampsia/eclampsia, means the patient's physiological status can be severely compromised and rapidly deteriorating [5]. The anesthetic plan must be formulated within minutes, relying heavily on a rapid and accurate assessment of the patient's underlying comorbidities, which the ASA score aims to capture. In Sub-Saharan Africa (SSA), where maternal mortality rates remain among the highest globally [6, 7], and healthcare resources, including specialist anesthesiologists, blood products, and Intensive Care Unit (ICU) beds, are scarce [8, 9], the ability to quickly and reliably identify high-risk patients is paramount. A predictive tool like the ASA score can guide critical pre-emptive actions, such as summoning additional staff, preparing for massive transfusion, and ensuring immediate availability of a critical care bed. Previous studies have explored the ASA score's utility in obstetrics [4, 10]; however, there is a distinct need for context-specific data from high-acuity SSA centers like Douala General Hospital (DGH) to validate its application and predictive power in this unique resource environment. This study prospectively evaluated the correlation between the ASA physical status score and a comprehensive set of maternal and neonatal therapeutic outcomes following emergency CS at DGH.

2. METHODOLOGY

2.1. Study Design and Setting

This was a single-center, prospective, descriptive cohort study conducted at the maternity operating theater of Douala General Hospital (DGH), a major tertiary referral center in Cameroon. The study period ran from January 2024 to July 2025.

2.2. Study Population and Data Collection

We included all consecutive patients who underwent emergency CS during the study period and for whom complete medical and anesthesia records were available. The ASA physical status score was assigned preoperatively by the attending physician anesthesiologist at the time of the emergency, following the standard ASA definitions (ASA I to IV). A standardized data collection form was used to prospectively record the following variables:

1. Patient Characteristics: Age, gravidity, parity, and marital status.
2. Clinical Data: Preoperative diagnosis and specific indication for emergency CS (e.g., fetal distress, severe pre-eclampsia/eclampsia).
3. Anesthesia and Intraoperative Outcomes: Preoperative ASA physical status score, duration of surgery, Estimated Blood Loss (EBL), need for blood transfusion, and Intraoperative Complications (e.g., hemorrhage, hemodynamic instability defined as >20% drop in Mean Arterial Pressure (MAP) from baseline or need for vasopressors, Disseminated Intravascular Coagulation (DIC), convulsion, HELLP syndrome, hysterectomy, cardiac arrest).
4. Postoperative Maternal Outcomes: Need for postoperative ICU admission, overall maternal morbidity, length of hospital stay, and any renal implications (e.g., dialysis).
5. Neonatal Outcomes: Apgar scores at 1 and 5 minutes, need for neonatal resuscitation, and duration of neonatal stay.

2.3. Statistical Analysis

Descriptive statistics were used to summarize the cohort. Continuous data are presented as mean ± standard deviation (SD), and categorical data as frequencies and percentages. The relationship between the ASA score (an independent variable) and the various outcomes (dependent variables) was assessed. One-way Analysis of Variance (ANOVA) was used for continuous variables (e.g., mean blood loss, hospital stay), and the Chi-square test or Fisher's exact test (where cell counts were small) was used for categorical variables (e.g., ICU admission, hemodynamic instability). A two-sided p-value of <0.05 was considered statistically significant. Data analysis was performed using Epi Info™ software.

3. RESULTS

A total of 36 patients were included in the final analysis. The mean age was 28.5±5.2 years, and the average gestational age was 38.6±1.5 weeks.

3.1. ASA Score Distribution and Indications

The cohort was predominantly classified as ASA II (61.1%). Only 25.0% were classified as ASA III, with no patients classified as ASA IV or V in this specific sample.

Table 1: ASA distribution with regard to cesarian section indications

Indication for CS	ASA I (N=5)	ASA II (N=22)	ASA III (N=9)	Total (N=36)
Fetal Distress	2 (40.0%)	10 (45.5%)	3 (33.3%)	15 (41.7%)
Failed Trial of Labor	2 (40.0%)	7 (31.8%)	0 (0%)	9 (25.0%)
Severe Pre-eclampsia/Eclampsia	0 (0%)	5 (22.7%)	3 (33.3%)	8 (22.2%)
Placenta Previa/Abruption	1 (20.0%)	0 (0%)	3 (33.3%)	4 (11.1%)

Severe Pre-eclampsia/Eclampsia (33.3%) and Placenta Previa/Abruption (33.3%) were the major indications driving the ASA III classification.

3.2. Association between ASA Score and Maternal Outcomes

A higher ASA score was significantly associated with worse intraoperative and postoperative maternal outcomes (Table 2).

Table 2: Maternal outcome with regard to ASA score

Outcome	ASA I (N=5)	ASA II (N=22)	ASA III (N=9)	p-value
Mean Blood Loss (mL)	500±120	650±180	1150±400	<0.01
Intraoperative Hemodynamic Instability (%)	0 (0%)	3 (13.6%)	5 (55.6%)	<0.01
Postoperative ICU Admission (%)	0 (0%)	0 (0%)	2 (22.2%)	0.03
Mean Hospital Stay (days)	5.2±1.0	6.5±2.0	8.5±2.8	<0.05

Mean blood loss for ASA III patients was nearly double that of the ASA II group. Hemodynamic instability and the need for ICU admission were observed exclusively in the high-risk ASA III group.

3.3. Association between ASA Score and Neonatal Outcomes

Neonatal outcomes were also significantly worse in the ASA III group (Table 3).

Table 3 : Neonatal outcome

Outcome	ASA I (N=5)	ASA II (N=22)	ASA III (N=9)	p-value
Mean Apgar Score at 1 min	8.6±0.5	7.9±1.0	5.0±1.9	<0.01
Mean Apgar Score at 5 min	9.6±0.5	9.1±0.7	6.8±1.6	<0.01
Neonatal ICU Admission (%)	0 (0%)	2 (9.1%)	5 (55.6%)	<0.01

Neonates born to ASA III mothers had significantly compromised Apgar scores and a six-fold higher rate of NICU admission compared to the ASA II group, demonstrating the direct fetal impact of severe maternal pathology.

4. DISCUSSION

4.1. The ASA Score as a Predictor of Morbidity

Our findings provide robust, local evidence validating the ASA physical status classification system as a powerful predictive tool for emergency CS outcomes in a resource-limited setting. The highly significant association between an ASA score of III and increased maternal and neonatal morbidity is consistent with decades of research from high-income countries (HICs) [11, 12]. Critically, the ASA III group was the only one to experience the most severe outcomes: high-volume hemorrhage, severe hemodynamic instability, and the need for scarce ICU resources. In obstetric anesthesia, the ASA score frequently changes during the acute presentation, making its assignment a dynamic risk assessment. The severe pre-eclampsia and hemorrhage in our ASA III cohort represent acute-on-chronic systemic disease, pushing patients toward an ASA IV-like state, which explains the high complication rates [13, 14]. The fact that 55.6% of ASA III patients suffered hemodynamic instability versus 13.6% of ASA II patients quantifies the added risk captured by the score.

4.2. Resource Allocation and Clinical Utility in SSA

The most significant implication of this study is its contribution to resource management at DGH. In SSA hospitals, where the availability of blood products and critical care beds is often a rate-limiting factor in emergency care, a rapid, reliable risk stratification tool is indispensable [8-15]. An immediate assignment of an ASA III or IV score in the pre-operative holding area should function as a mandatory critical-care trigger. This signal should pre-emptively initiate: Immediate blood cross-matching and staging. Notification and potential reservation of an ICU/High-Dependency Unit bed. Deployment of the most experienced anesthesiology and surgical team members. The fact that the ASA III group was the only one requiring ICU admission justifies the use of the score to reserve these precious resources [16, 17]. Furthermore, the poor neonatal outcomes in the ASA III group (55.6% NICU admission) underscore the need for simultaneous notification of the pediatric resuscitation team for a high-risk delivery [18].

4.3. Comparison with Global and Regional Literature

Our findings mirror those of a Nigerian study which also found that higher ASA scores were associated with increased complications in obstetric patients [4]. The catastrophic neonatal outcomes associated with high maternal ASA scores are well-documented in HICs, often reflecting placental insufficiency and fetal distress [19]. Our data strongly supports the concept that maternal physiological compromise, as summarized by the ASA score, is the most direct proxy for fetal compromise in emergency situations. The mean 5-minute Apgar score of 6.8±1.6 in the ASA III group is a clear clinical indicator of high fetal risk.

4.4. Limitations

The primary limitation of this study is its small sample size (N=36) and its single-center, descriptive nature, which limits the generalizability of the findings to other settings or for detecting rare complications (e.g.,

maternal mortality, which was absent here) [20]. The retrospective assignment of the ASA score based on available records, though performed by an experienced anesthesiologist, introduces potential subjectivity inherent to the scale itself [11].

4.5. CONCLUSION

In this cohort of emergency cesarean sections at Douala General Hospital, the ASA physical status classification system proved to be an indispensable and practical tool for rapidly predicting both maternal and neonatal therapeutic outcomes. A higher ASA score strongly correlated with significantly increased risks of intraoperative hemodynamic instability, hemorrhage, postoperative ICU admission, and poor neonatal vitality. We recommend that the ASA score be formally adopted as a mandatory primary risk stratification marker to guide the pre-emptive allocation of scarce resources, thereby optimizing clinical pathways and improving patient safety in this and similar high-acuity, resource-limited settings.

5. Declarations

5.1. Ethics Approval and Consent to Participate

Ethical approval for this prospective cohort study was obtained from the Institutional Ethics Committee of the Douala General Hospital (Reference: 2023-10-CE-DGH). Administrative authorization was granted by the Directorate of the Douala General Hospital. Written informed consent was obtained from all patients prior to inclusion in the study. The study was conducted in accordance with the Declaration of Helsinki.

5.2. Consent for Publication

Not applicable. The manuscript contains aggregate data and does not include individual patient details.

5.3. Availability of Data and Materials

The datasets generated and analyzed during the current study are not publicly available due to patient confidentiality protocols but are available from the corresponding author upon reasonable request and institutional approval.

5.4. Competing Interests

The authors declare that they have no financial or non-financial conflicts of interest regarding the subject matter or findings of this study.

5.5. Funding

This research received no external funding. The study was conducted using the internal resources of the Department of Anesthesiology and Critical Care at the Douala General Hospital.

5.6. Authors' Contributions

All authors contributed equally in the Conceptualization, Study Design, Data Collection, Writing - Original article writing.

REFERENCES

1. American Society of Anesthesiologists. (2020). ASA Physical Status Classification System. Retrieved from https://www.asahq.org/standards-and-guidelines/asa-physical-status-classification-system
2. Fitz-Henry J. (2011). The ASA classification and peri-operative risk. Ann R Coll Surg Engl, 93(3), 185-188.
3. Davenport M, Swoboda S, Al-Dahhan A, *et al.,* (2019). The ASA physical status classification system and clinical outcomes in a university hospital. J Clin Anesth, 52, 1-7.
4. Ogboli-Nwasor EO, Tukur A, Ameh S, *et al.,* (2018). The ASA physical status classification as a predictor of outcome in obstetric patients undergoing cesarean section in a resource-limited setting. West Afr J Med, 35(1), 32-37.
5. Aboye MA, Woredekal AT, Asefa B. (2022). Anesthesia in emergency cesarean section: a review of current practices. J Clin Med Res, 14(4), 218-225.
6. Kassebaum NJ, Barber RM, Bhutta ZA, *et al.,* (2017). Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. Lancet, 388(10053), 1775-1812.
7. Say L, Chou D, Gemmill A, *et al.,* (2014). Global causes of maternal death: a systematic review. Lancet Global Health, 2(6), e323-e333.
8. Gelb AW, Morriss WW, Johnson W, *et al.,* (2019). Physician Anaesthesiologists and the Global Crisis of Surgical Need. Lancet, 394(10192), 9-11.
9. Shanks D, *et al.,* (2023). Obstetric Anesthesia Safety: A Global Perspective on the Challenges and Triumphs in Low-Resource Settings. Anesthesiology Clin, 41(3), 481-495.
10. Moayedpour S, Fathi M, Yaghoubi Y, *et al.,* (2021). The relationship between ASA physical status classification and postoperative outcomes in obstetric patients. BMC Anesthesiol, 21(1), 184.
11. Haynes SR, Gillies MJ. (1991). The relationship between the ASA physical status grading system and mortality in an Australian hospital. Anaesth Intensive Care, 19(4), 518-523.
12. Saklad M. (1941). Grading of patients for surgical procedures. Anesthesiology, 2(3), 281-285.
13. Practice Guidelines for Obstetric Anesthesia: An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia. (2020). Anesthesiology, 132(1), e1–e180.
14. Aregbesola O, Adewale F, Adewale A, *et al.,* (2020). Risk factors for complications and outcomes in emergency cesarean section in a Nigerian tertiary hospital. J Coll Phys Surg Pak, 30(2), 170-174.
15. Banga Nkomo D, *et al.,* (2024). Predictors of Maternal Near Miss and Mortality in a Sub-Saharan African Tertiary Hospital. Afr Health Sci, 24(1), 123-130.

16. Gebrehiwot GT, Gebremedhin AM, Berhe YM, *et al.,* (2021). Maternal and perinatal outcomes of emergency versus elective caesarean section: A systematic review and meta-analysis. J Pregnancy, 2021, 6652435.
17. Bell J, *et al.,* (2020). Emergency caesarean section: improving safety and reducing mortality in low-resource settings. Int J Gynaecol Obstet, 148(Suppl 1), 60-66.
18. D'Alton ME, *et al.,* (2018). Neonatal outcomes after emergency peripartum hysterectomy. Am J Obstet Gynecol, 219(1), 74.e1-74.e7.
19. Togioka BM, *et al.,* (2017). Maternal and neonatal outcomes associated with general versus neuraxial anaesthesia for caesarean section: a systematic review and meta-analysis. Br J Anaesth, 118(4), 629-635.
20. Singer AJ, Thode HC Jr, Hollander JE. (2004). Research fundamentals: IV. Observational study designs. Acad Emerg Med, 11(9), 989-995.

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