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ORIGINAL RESEARCH ARTICLES

Injury patterns and health outcomes among pregnant women seeking emergency medical care in Kumasi, Ghana: Challenges and opportunities to improve care



Types de blessures et résultats pour la santé chez les femmes enceintes ayant besoin d'une prise en charge médicale d'urgence à Kumasi au Ghana: défis et opportunités relatifs à l'amélioration des soins

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Introduction: In high-income countries, injury is the most common cause of non-obstetric death among pregnant women. However, the injury risk during pregnancy has not been well characterized for many developing countries including Ghana. Our study described maternal and fetal outcomes after injury at the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, and identified associations between the prevalence of poor outcomes and maternal risk factors.

Methods: We conducted a cross-sectional study to identify pregnant women treated for injury over a 12-month period at KATH in Kumasi, Ghana. Descriptive statistics were used to characterize the population. We identified the association between poor outcomes and maternal risk factors using multivariable Poisson regression.

Results: There were 134 women with documented pregnancy who sought emergency care for injury (1.1% of all injured women). The leading injury mechanisms were motor vehicle collision (23%), poisoning (21%), and fall (19%). Assault was implicated in 3% of the injuries. Eleven women (8%) died from their injuries. The prevalence of poor fetal outcomes: fetal death, distress or premature birth, was high (61.9%). One in four infants was delivered prematurely following maternal injury. After adjusting for maternal and injury characteristics, poor fetal outcomes were associated with pedestrian injury (adjusted prevalence ratio (aPR) 2.5, 95% CI 1.5–4.6), and injury to the thoraco-abdominal region (aPR 2.1, 95% CI 1.4–3.3).

Conclusions: Injury is an important cause of maternal morbidity and poor fetal outcomes. Poisoning, often in an attempt to terminate pregnancy, was a common occurrence among pregnant women treated for injury in Kumasi. Future work should address modifiable risk factors related to traffic safety, prevention of intimate partner violence, and prevention of unintended pregnancies.

Introduction: Dans les pays à revenu élevé, les blessures sont la cause la plus fréquente de décès non obstétrical chez les femmes enceintes. Toutefois, le risque de blessure au cours de la grossesse n'a pas été bien caractérisé pour de nombreux pays en développement, dont le Ghana. Notre étude a décrit les résultats maternels et fœtaux après une blessure à l'Hôpital universitaire Komfo Anokye (KATH) à Kumasi au Ghana, et a identifié des liens entre la prévalence de mauvais résultats et les facteurs de risque maternels.

Méthodes: Nous avons mené une étude transversale visant à identifier les femmes enceintes traitées pour des blessures sur une période de 12 mois au KATH, à Kumasi, au Ghana. Des statistiques descriptives ont été utilisées pour caractériser la population. Nous avons identifié le lien entre les résultats médiocres et les facteurs de risques maternels à l'aide d'une régression de Poisson à plusieurs variables.

Résultats: Il existait 134 femmes en état de grossesse documenté ayant nécessité une prise en charge d'urgence pour des blessures (1,1% de toutes les femmes blessées). Les premières causes de blessures étaient les collisions de véhicule (23%), les empoisonnements (21%) et les chutes (19%). Trois pourcent des blessures étaient causées par une agression. Onze femmes (8%) sont décédées des suites de leurs blessures. La prévalence des mauvais résultats fœtaux: le décès du fœtus, des souffrances ou une naissance prématurée, était élevée (61,9%). Un nourrisson sur quatre est né prématurément suite à une blessure maternelle. Après ajustement en fonction des caractéristiques de la mère et des blessures, les mauvais résultats fœtaux étaient associés aux blessures occasionnées aux piétons (ratio de prévalence ajusté (RPa) de 2,5, IC 95% 1,5-4,6); et des blessures occasionnées à la région thoraco-abdominale (RPa 2,1 (IC 95% 1,4-3,3)).

Conclusions: Les blessures représentent une cause importante de morbidité maternelle et des mauvais résultats fœtaux. L'empoisonnement, souvent subi lors d'une tentative de mettre fin à la grossesse, était un phénomène courant chez les femmes enceintes traitées pour des blessures à Kumasi. Les futurs travaux devraient aborder

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les facteurs de risque sur lesquels on peut influencer, tels que ceux liés à la sécurité routière, à la prévention de la violence conjugale et à la prévention des grossesses non désirées.

African relevance

- Reduction in maternal mortality rates is an international health priority.
- Little is known about the impact of injury, violence, and poisoning on maternal or fetal outcomes for women living in low- and middle-income countries.
- This study highlights screening for pregnancy among injured women in low- and middle-income countries.

Introduction

In high-income countries, injury is the most common cause of non-obstetric death among pregnant women. In the United States, an estimated one out of 12 pregnant women will experience an injury,¹ and one out of 25 may seek emergency care.² Motor vehicle crashes, intimate partner violence and falls are common causes of injury during pregnancy,³⁻⁷ however improvements in seat belt use and traffic safety have reduced the risk of traffic-related injury among pregnant women.^{4,8} Elevated risk of maternal mortality from violence (homicide and suicide) extended into the post-partum period in some high-income countries,^{9,10} though rates of violence were not elevated in others.^{9,11}

Little is known about the impact of injury, violence, and poisoning on maternal or fetal outcomes for women living in low- and middle-income countries (LMICs). Among pregnant women living in LMICs, high risk unintentional injuries such as pedestrian injury may be more common,¹² and the limited use of seat belts and other prevention strategies may increase the risk for vehicle occupants.¹³

There has been limited evaluation of injury-related maternal and fetal deaths during pregnancy in Ghana, where trauma is a leading cause of morbidity and mortality.²² The objective of this study was to describe maternal and fetal outcomes after trauma at the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, and identify any association between the prevalence of poor outcomes and maternal risk factors (i.e. demographic and pregnancy characteristics) and injury characteristics.

Methods

We conducted a cross-sectional study to investigate adverse maternal and fetal outcomes after trauma in Kumasi, Ghana. Medical records for all females 15 years or older who presented to the KATH Emergency Centre (EC) were reviewed to identify women who were recorded as pregnant at the time of presentation after injury.

The primary outcomes were maternal death and poor fetal outcome – defined as fetal distress, premature birth, still birth, or fetal death. Covariates included maternal socio-demographic characteristics (i.e. age, ethnicity, religion, mari-

tal status, education, insurance status, geographical region of residence, employment, and reported alcohol or drug use by partner), pregnancy and family characteristics (i.e. gravidity, estimated gestational age, and number of live children), and injury characteristics (i.e. mechanism, intent, and location of injury).

Descriptive statistics were compiled for exposures and outcomes of interest. Data ascertainment was mostly complete with the exception of partner alcohol/drug use (53% missing) and intent (0.8% missing). Missing data were noted in result tables when missingness exceeded 5%. Maternal alcohol/drug use was rarely recorded in the medical chart. Pearson's chi-square test was used to assess whether observed differences between groups arose by chance, and the Fisher exact test was used in cases where a single data cell had fewer than five observations. Bivariate and multivariable Poisson regression with robust standard errors were used to determine prevalence ratios given that outcomes were relatively frequent (8.2% and 61.9% of study population with poor maternal and fetal outcomes, respectively). Multivariable model covariates were chosen based on statistical significance in bivariate analysis and/or known associations based on review of the relevant literature. Covariates considered were maternal age, ethnicity, marital status, maternal education, insurance status, gestational age, number of living children, location of injury, injury mechanism, and anatomical location of injury.

All data were analyzed with STATA version 12.1 (College Station, TX). The study was approved by the Committee for Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology in Kumasi/Komfo Anokye Teaching Hospital, Ghana and the Institutional Review Board of the University of Washington in Seattle, USA.

Results

A total of 29,165 charts were reviewed. Of the total number reviewed, 11,764 (40.3%) patients were women, of which 134 (1.1%) had documented evidence of pregnancy. Maternal demographic, fetal, and injury characteristics of this population are presented in [Table 1](#).

Most injured pregnant women were between 18 and 35 years of age (81.3%); only 3% were younger than 18. Nearly three out of four injured females were married (71.6%), and most (79.1%) had health insurance. Most women (62.0%) had completed junior secondary education or higher, though 13.4% reported no formal education.

Among the injured women, the most common mechanisms of injury were traffic-related (35.1%), with vehicle vs. pedestrian collisions accounting for 12.7% of injuries, and bus or private vehicle collisions accounting for 22.4%. The second most common cause of injury was poisoning (20.9%). Fourteen percent of pregnant women evaluated required emergency care for a laceration or penetrating wound. In this study, the

Table 1 Characteristics of pregnant women who sought emergency care for injury, *n* = 134.

Demographic characteristics	Total study population, <i>n</i> (%)
Age (years)	
Less than 18	4 (3.0)
18–25	46 (34.3)
26–35	63 (47.0)
36 or older	21 (15.7)
Ethnicity	
Akan	61 (45.5)
Other	73 (54.5)
Religion	
Christian	78 (58.2)
Muslim	48 (35.8)
Other	8 (6.0)
Married	
Yes	96 (71.6)
No	38 (28.4)
Education	
None	18 (13.4)
Primary	33 (24.6)
Junior secondary	36 (26.9)
Senior secondary	30 (22.4)
Tertiary	17 (12.7)
Insurance status	
Yes	106 (79.1)
No	28 (20.9)
Residence*	
Urban	81 (60.5)
Peri-urban	53 (39.6)
Employment	
Employed	79 (59.0)
Unemployed	55 (41.0)
Alcohol/drug use by partner**	
No	53 (82.8)
Yes	11 (17.2)
<i>Pregnancy/family characteristics</i>	
Index pregnancy number	
1	3 (2.2)
2	39 (29.1)
3	41 (30.6)
4	27 (10.2)
5+	24 (17.9)
Number of living children*	
0	1 (0.8)
1	53 (39.6)
2	50 (37.3)
3	20 (14.9)
4+	10 (7.5)
Gestational age*	
23–30 weeks	4 (3.0)
31–36 weeks	36 (26.9)
37–42 weeks	51 (38.1)
43–48 weeks	43 (32.1)
<i>Injury characteristics</i>	
Mechanism	
Fall	25 (18.7)
Cut/laceration/stab	19 (14.2)
Motor vehicle collision	30 (22.4)
Pedestrian	17 (12.7)
Blunt/struck by someone (e.g. assault)	4 (3.0)
Burn	11 (8.2)
Poisoning	28 (20.9)

Table 1 (Continued)

Demographic characteristics	Total study population, <i>n</i> (%)
Intent	
Unintentional	92 (69.2)
Intentional	41 (30.8)
Anatomic location	
Head/neck	21 (15.7)
Thorax (including abdomen/back)	27 (20.2)
Extremities	53 (39.6)
Genitalia	5 (3.7)
Generalized (e.g. poisoning)	28 (20.9)

* Some data elements round to 99.9 or 100.1 due to rounding estimation.

** Missing 70 observations (52%).

cause of injury was listed as assault in only 3% of cases, and the relationship with the assailant was rarely indicated.

Eleven of the 134 pregnant women evaluated in this study died during hospital admission. There were 37 fetal deaths including still births; almost one in every three fetuses died (27.6%). After including fetal distress (*n* = 13) and premature birth (*n* = 33), a total of 83, or 61.9% of the women included in the study sustained a poor fetal outcome as a result of their injury.

The rate of maternal injury death varied widely by demographic and pregnancy characteristics, including religion, education, insurance status, residence, employment status, and number of live children. Maternal death also varied by injury characteristics, including mechanism of injury and anatomic location of injury (see [Supplemental materials](#) for relative proportions and *p*-values). However in univariate models, the covariates most strongly associated with maternal death were religion, mechanism of injury, and anatomic location of injury.

For example, pregnant women who suffered injury to the thoraco-abdominal region were 5.2 times more likely to be fatally injured when compared to women who sustained an extremity injury (extremities; unadjusted PR 5.2, 95% CI 1.5–18.2). We were not able to examine multivariable models of associations with maternal death because of the relatively small number of fatal injuries in our study population.

Poor fetal outcome included fetal distress, premature birth, or fetal death including stillbirth. Poor fetal outcome varied across all examined demographic characteristics, pregnancy and birth characteristics and injury characteristics with the exception of education, insurance status, and alcohol use by partner (see [Supplemental materials](#) for relative proportions and *p*-values). Notably, poor fetal outcomes were more common among younger mothers: 51.8% of mothers with poor fetal outcome after injury were less than 26, compared to only 13.7% of mothers without poor fetal outcome. Furthermore, poor fetal outcome was more common among mothers with non-Akan ethnicity: 74.7% of mothers with poor fetal outcome after injury were of an ethnicity other than Akan, compared to only 21.6% of mothers without poor fetal outcome. Poor fetal outcomes were also more common among non-married women and among women living in non-urban settings. As expected, lower gestational age was associated

Table 2 Prevalence ratios for poor fetal outcome.

Demographic characteristics	Crude PR	Adjusted PR**
<i>Demographic characteristics</i>		
Age (years)		
Less than 18	1.9 (1.5–2.4)*	0.9 (0.5–1.6)
18–25	1.6 (1.2–2.1)*	1.2 (0.8–1.6)
26–35	Ref	Ref
36 or older	0.6 (0.3–1.2)	1.6 (0.8–3.1)
Married		
Yes	Ref	Ref
No	1.7 (1.3–2.1)*	1.7 (1.2–2.4)*
Education		
Tertiary/SECONDARY	Ref	Ref
Primary/none	1.1 (0.8–1.4)	0.7 (0.5–1.1)
Insurance status		
Yes	Ref	Ref
No	1.1 (0.8–1.5)	0.8 (0.6–1.2)
Residence		
Urban	Ref	Ref
Peri-urban	1.4 (1.1–1.8)*	1.1 (0.8–1.4)
Employment		
Employed	Ref	Ref
Unemployed	0.7 (0.5–1.0)*	0.6 (0.4–0.8)*
Alcohol/drug use by partner		
No	Ref	Ref
Yes	1.4 (1.1–1.8)*	1.4 (0.4–5.5)
<i>Pregnancy/family characteristics</i>		
Index pregnancy number		
1	Ref	Ref
2	0.7 (0.6–0.9)	0.6 (0.3–1.1)
3	0.7 (0.6–0.9)	0.8 (0.5–1.5)
4	0.6 (0.5–0.8)	1.2 (0.6–2.3)
5+	0.3 (0.2–0.6)	0.5 (0.2–1.4)
Number of children alive		
0	Ref	Ref
1	0.8 (0.7–0.9)*	0.9 (0.5–1.7)
2	0.7 (0.5–0.8)*	0.8 (0.4–1.6)
3	0.4 (0.2–0.6)*	0.4 (0.2–1.1)
4+	0.2 (0.1–0.7)*	0.3 (0.1–0.8)*
<i>Demographic characteristics</i>		
Gestational age		
23–30 weeks	1.7 (1.3–2.1)*	0.8 (0.5–1.2)
31–36 weeks	0.5 (0.2–1.2)	1.3 (0.9–1.8)
37–42 weeks	Ref	Ref
43–48 weeks	1.8 (1.3–2.6)*	0.8 (0.6–1.0)
<i>Injury characteristics</i>		
Mechanism		
Fall	1.1 (0.7–1.7)	1.2 (0.6–2.2)
Cut/laceration/stab	0.7 (0.3–1.3)	0.7 (0.4–1.2)
Motor vehicle collision	Ref	Ref
Pedestrian	1.8 (1.3–2.4)*	2.5 (1.5–4.6)*
Blunt/struck by someone (e.g. assault)	1.2 (0.8–1.9)	0.9 (0.6–1.5)
Poison/overdose	1.7 (1.2–2.3)*	1.9 (1.0–3.7)
Intent		
Unintentional	Ref	Ref
Intentional	1.7 (1.3–2.1)*	1.5 (0.9–2.6)
Anatomic location		
Head/neck	0.4 (0.2–0.9)*	0.7 (0.4–1.2)
Thorax	1.4 (1.0–1.9)	2.1 (1.4–3.3)*
Extremities	Ref	Ref
Generalized (e.g. poisoning)	1.7 (1.3–2.2)*	Omitted/co-linear

* Indicates statistical significance at a level of 0.05;

** Adjusted for age, ethnicity, marital status, maternal education, insurance status, gestational age, number of children alive (categorical), location of injury, mechanism of injury, and anatomical location of injury.

with a higher prevalence of poor fetal outcome. Crude prevalence ratios are presented in [Table 2](#).

In the multivariable model, maternal age, ethnicity and employment status remained associated with poor fetal outcome ([Table 2](#)). Ethnicity other than Akan was associated with a 50% increase in prevalence of poor fetal outcome (aPR 1.5, 95% CI 1.2–1.9). Being unmarried was associated with a 70% increase in the prevalence of poor fetal outcome (aPR 1.7, 95% CI 1.2–2.4). Women who were unemployed or not in the formal workforce (e.g. unpaid housework) had a lower prevalence of poor fetal outcome, compared with women who were actively employed (aPR 0.6, 95% CI 0.4–0.8).

Pedestrian injuries were associated with higher risk of poor fetal outcome, compared with occupants in a motor vehicle collision (aPR 2.5, 95% CI 1.5–4.6). A poor fetal outcome was also more likely to result from injury to the thoraco-abdominal region, compared with extremity injury (aPR 2.1, 95% CI 1.4–3.3).

To further explore the intent of poisonings and to evaluate possible violence in the home or community, we evaluated the intent of injury across each mechanism. As expected, the majority of falls (93%) and motor vehicle collisions (100%) including those involving pedestrians (94.1%) were unintentional. All burns were also described as unintentional. However, about half of all penetrating injuries (52.6%), almost all poisonings (99.8%), and all blunt injuries were intentional (e.g. assault).

Discussion

The United Nations 5th Millennium Development Goal identified a reduction in maternal mortality as a top international health priority, but there has been little progress toward this goal in African countries.²³ With improved surveillance and verbal autopsy, there is an increasing recognition that a sizeable proportion of maternal mortality and fetal risk may come from non-obstetric causes such as infectious diseases,^{17,20} injury,^{5,13} violence^{2,14,15,18,24} and poisoning.^{16,20,21,25} In a recent Kenyan study, over two-thirds of maternal mortality risk was attributed to non-obstetrical causes.²⁰ Maternal mortality remains unacceptably high in Ghana with causes attributable to hypertensive states in pregnancy, hemorrhage, and genital tract sepsis.²⁶ The high rates of maternal and fetal mortality and morbidity from this study suggest that injury is an under-recognized source of maternal and fetal mortality and morbidity in Ghana and this may well apply to most LMICs.

More generally, for women living in low-income African countries, the lifetime risk of dying from any pregnancy-related cause may be 300 times greater than the risk posed to a woman living in a high-income country,^{20,27} thus underscoring formidable inequities in maternal mortality. Redressing these inequities requires early recognition of pregnancy among injured women of childbearing age. It is likely that this study, which relied upon documentation of pregnancy in the medical chart, significantly underestimated the true number of injuries among pregnant women. In many sub-Saharan African countries, pregnancies are kept private; a woman and her family may not disclose the pregnancy when presenting for care.²⁸

In the absence of a noticeably gravid uterus, or vaginal bleeding, detection of pregnancy in an injured woman may

be rare, as suggested by the low rate of identified pregnancy among injured women receiving care at KATH. The high maternal and fetal mortality and morbidity rates from this study suggest benefits to universal low-cost screening of all injured women of reproductive age for pregnancy. Urine pregnancy test (UPT) for all injured women of reproductive age, documentation of the last menstrual period, and abdominal examination – already part of the trauma examination – are suggested steps to improve screening for pregnancy among injured women.²²

While health personnel would be advised to screen for pregnancy in injured women of childbearing age, additional preventive measures in reducing injury risk in this population are highly recommended. In Ghana, road traffic injury is a leading cause of preventable death for children and adults alike. Pedestrian injuries account for the largest portion of deaths, and can be ameliorated by strategies that consider the needs of all road users.²⁹ For pregnant women who are riding in cars, correct usage of seat belts is known to significantly reduce the risk of death and injury following a motor vehicle crash.^{4,6,8,13} In high-income and low-income countries, many pregnant women fail to use seatbelts, despite known risks.^{4,6,13,30} Including education on injury prevention and seat belt use in prenatal care is a promising strategy for injury prevention. In addition to these preventive strategies, most pregnant women are not screened for substance abuse in Ghana, though alcohol use is a significant contributor to the risk of injury as well as other serious risks to the developing fetus.³¹

One of the most concerning findings of our study was the high rate of poisoning or overdose. Studies in Ghana^{25,26,32,33} and elsewhere^{16,20,21,32,33} have identified the serious risks to maternal health from attempts to terminate an unintended pregnancy in environments where family planning services may be difficult to access, many pregnancies are unintended, and the unmet need for family planning is high.³⁴ Some women hold the erroneous belief that the fetus lies in the stomach and attempt ingestion of chemicals, concoctions and sometimes grounded glass with the intention of terminating the pregnancy.³³ Unmarried females may have limited access to family planning services when contraceptives are considered appropriate only for married women.^{35–37} Access to contraception and education on comprehensive abortion services targeting all women of reproductive age are needed to reduce these injury risks.^{32,38}

In our study, we were unable to discretely identify intimate partner violence (IPV), as we were unable to ascertain the perpetrator in intentional injuries. That being said, all “struck by” injuries were reported as intentional, and it is not unreasonable to assume these occurred by domestic partners. With this in mind, IPV was infrequently identified in the medical record as having contributed to injuries during pregnancy; we believe this may be due to significant underreporting. IPV against pregnant women is common in Ghana,³⁹ other African countries^{18,19} and high-income countries alike.⁹ This violence is widely under-recognized and contributes significantly to pain, suffering, and serious injury for women and their children. In a study of pregnant women living in poor neighborhoods in Mumbai, India, one-in-seven pregnant women was a victim of IPV during the periods before and shortly after pregnancy.¹⁴ Disturbingly high rates of IPV during pregnancy were reported in studies from Bangladesh,^{15,16} India,¹⁷ Zimbabwe¹⁸ and Nigeria,¹⁹ where IPV was a leading cause of injury-related

death during pregnancy. Another under-reported cause of injury mortality during pregnancy is poisoning, sometimes motivated by attempts to terminate an unwanted pregnancy.^{16,20,21}

Disagreements about unwanted pregnancies may precipitate physical assault.^{40,41} Screening for IPV risk and referral to social support services when they exist, are needed at every health encounter for pregnant women, and are even more important among injured women seeking emergency care.³¹ There is also the need to develop such services across the country and strengthen existing ones.

There are several important limitations of this study, some of which are also opportunities to improve the recognition and care of injured pregnant women. First, pregnancy was under-recognized. Injured women of childbearing age were infrequently screened for pregnancy by any method. It is likely that pregnancy was more often recognized in cases of moderate to severe injury or in the context of miscarriage, so that less serious injuries were missed. Less obviously injured pregnant women may also have been sent directly to the obstetrical ward instead of the EC. Secondly, this was not a prospective study; therefore, important injury risk factors were likely under-reported particularly for sensitive topics such as attempts to terminate pregnancy, alcohol or drug use, or IPV. Lastly, this was a single institution study of women who sought emergency care for injury. Adding an injury module to regular demographic household surveys would provide important population-level data on injury risk.

Conclusions

Injury is an under-recognized cause of maternal morbidity and poor fetal outcome in Ghana. It is important to identify pregnancy in the injured woman of childbearing age in order to provide evidence-based care to support the wellbeing of the mother and growing fetus,⁴² as well as to avoid unnecessary risk or exposure to radiation or potentially harmful therapies.^{3,43}

Opportunities to improve care for pregnant women who sustain an injury during pregnancy include: (1) the need for universal screening and documentation of pregnancy among injured women of childbearing age, (2) consistent screening for intimate partner violence among injured women, along with documented social service support for victims, (3) consideration of strategies to reduce the burden of road traffic injury, including routine recommendations for seat belt use among pregnant women, and (4) public health approaches to reducing unintended pregnancy through improved access to family planning.

Conflict of interest

This study was funded by a grant (D43-TW007267) from the Fogarty International Center, US National Institutes of Health and by the SMS/Gates project (JHU 2000009941). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health nor the Bill and Melinda Gates Institute for Population and Reproductive Health. MOA is an editor for the African Journal of Emergency Medicine. All peer

reviews are performed blinded and the author was not involved with the editing of this paper. The authors declare no further conflict of interest.

Dissemination of results

Results from this study were shared with the staff of the Emergency Medicine Directorate of the Komfo Anokye Teaching Hospital through an informal presentation.

Author contribution

MOA, EOD and BE conceived of and refined the study design. MOA supervised data collection. KFO, MOA and BE analyzed the data. MOA, KFO and BE wrote the first draft of the paper. EOD, GO, EO, CM and PD provided significant input to the manuscript, revised it critically for important intellectual content, and gave their final approval for the version to be published.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.afjem.2016.01.003>.

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