Original Article

Prevalence Rate of Spontaneously Reported Adverse Events and Determinants of Serious Adverse Events amongst Three Outpatient Care Settings in Ghana: Findings and Implications

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Abstract

Introduction: Most evidence of adverse drug events (ADEs) comes from hospitals as the risks associated with hospital care are higher. However, underreporting of ADEs is a critical problem in all healthcare settings. This is important in sub-Saharan African countries including Ghana with limited resources and a high prevalence of both infectious and non-infectious diseases. Consequently, this study sought to determine the annual prevalence of spontaneously reported ADEs using 6-year reports and factors associated with the occurrence of serious ADEs amongst outpatient care settings in hospitals in Ghana to provide future guidance. **Methodology:** This is a cross-sectional study using duplicates of the Ghana Food and Drugs Authority adverse event forms retrieved from three outpatient care settings submitting their reports to the National Pharmacovigilance Centre in Ghana between 2013 and 2018. Descriptive and bivariate analyses were performed. **Results:** Overall, 93 spontaneously reported cases of ADEs were identified during the study period. The annual prevalence rate was 192 reports/1000,000 population amongst our study population, and the rate of serious ADE was 35.48% (95% confidence interval: 25.83%–46.09%). Serious ADEs were associated with the type of indication for which the drug was prescribed ($P = 0.048$), the duration of the ADE ($P = 0.047$) and the need to administer treatment for the ADE at the reporting facility ($P = 0.017$). **Conclusion:** Early spontaneous reporting of ADEs at outpatient settings is essential. Patient and provider education and awareness of potential ADEs must be intensified for early identification and reporting.

Keywords: Adverse drug event, ghana, outpatient care setting, serious adverse drug event, spontaneous reporting

Introduction

Historically, an adverse drug reaction (ADR) has been defined as a harmful or unpleasant unintended reaction, resulting from an intervention related to the use of a medicine which occurs at doses normally used in humans.[1] A more closely related term is an adverse drug event (ADE), which is an injury resulting from the use of a medicine but not necessarily causally related to it.[2] ADEs include medication errors, ADRs, drug allergies or overdoses.[3] While these terms are often used interchangeably, typically ADEs are used as this is a more encompassing term.

ADEs are costly not only economically to healthcare systems but also negatively to patients and the healthcare system in terms of trust that patients and their relatives will have in the healthcare system if ADEs lead to permanent injury or death.[3-5] Studies have shown that approximately 5%–35% of all hospital admissions are the result of ADEs, while over 3.5 million physician office visits and over 1 million

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emergency department visits in the USA have been reported to occur annually due to ADEs.[3,4,6] One systematic review found that when ADEs are reported in outpatient settings, they are more likely to be associated with a higher length of stay on admission than when reported in inpatient settings.[3] Consequently, efforts must be made to quickly identify and manage non-preventable ADEs to limit their detrimental effect. This is particularly important during the current COVID-19 pandemic when different treatments are being proposed, some with serious side effects such as cardiac side effects as well as concerns with liver and kidney damage, when re-purposed as potential treatments as seen with hydroxychloroquine and remdesivir.[7-9]

Low- and middle-income countries (LMICs) are more commonly affected by the negative effects of ADEs than high-income countries due to the poorer state of the infrastructure of their healthcare system, unreliable supply of quality medicines and the relatively low numbers of essential healthcare staff.[10,11] Alongside this, sub-Saharan Africa has a high prevalence of both infectious and non-infectious diseases especially when compared to high-income countries. This double burden of disease, including high prevalence rates of co-morbidities, increases the use of polytherapy as well as the chronic use of medicines amongst a growing elderly population, exposing them to preventable ADEs.[12-14]

Identifying and documenting ADEs in clinical practice is important as they help with the early detection of signals, product information amendments and improvements in subsequent prescribing. Acknowledging potential ADEs in LMICs has also resulted in improved processes surrounding the administration of oncology medicines.[15] Spontaneous reporting has widely been identified as an important means of gathering safety data on medicines after their marketing authorisation as they provide the highest volume of data at the lowest cost.[5] However, underreporting of ADEs is a major challenge worldwide especially in LMICs such as sub-Saharan African countries,[5,16,17] with underreporting associated not only with patient-related factors but also facility and health provider-related factors.[18,19] Individual case safety reports from Africa to the World Health Organization (WHO) International Database, known as Vigibase®, currently comprises <1% of the total global reports while the continent comprises approximately 15% of the world's population, causing concern.[17] Potential reasons for underreporting in the sub-Saharan Africa include a lack of awareness and ignorance regarding reporting structures; poor skills for ADE identification; perceived workload for assessing, documenting and reporting ADEs; poor attitudes towards reporting as well as inertia.[5,20,21] Similar issues may well be seen in other LMICs.

Ghana, a sub-Saharan African country, joined the WHO International Drug Monitoring Programme in November 2001 as the 65th member of the programme and the first country in West Africa.[22] The National Pharmacovigilance Centre of the Ghana Food and Drugs Authority (FDA) became operational in 2003 with its main function of coordinating the activities of post-marketing surveillance of medicines registered in the country. That year, Ghana was nominated as one of the three countries tasked with reporting ADEs online using the then newly developed Vigibase® online software. The Centre was designated as a WHO Collaborating Centre in 2009 with the responsibility of providing pharmacovigilance (PV) training across Africa, building capacity, promoting advocacy and strengthening reporting.[23]

The PV system in Ghana has subsequently been decentralised to help promote ADE reporting, where safety reports sent by institutional contact persons (ICPs) in almost all healthcare facilities in the country are received through designated FDA staff in regional offices and forwarded to the Centre. The Centre also collaborates with public health programmes including the expanded programme for immunisation to ensure that medicines used in these programmes are safe, efficacious and of good quality.[24] However, similar to most spontaneous PV systems worldwide, the PV system in Ghana is still plagued with underreporting. In 2018, the FDA received a total of 3729 reports, of which 2597 were spontaneous reports.[25] With the population of Ghana being 29.6 million,[26] the prevalence of spontaneous reports received in that year was 88/1000,000 population, falling short of the WHO Uppsala Monitoring Centre recommendation of 200 reports/1000,000 population per year.[22,25] Currently, the major strategy for promoting spontaneous reporting in Ghana is through awareness creation and training programmes for healthcare professionals. The FDA has also since 2013 launched a number of initiatives to improve spontaneous ADE reporting rates to enhance signal generation. This includes the use of an online database, patient-reporting initiatives, the SafetyWatch System and more recently a Patient Safety Centre and a Med Safety App to enable consumers, patients and healthcare professionals to report safety issues concerning medicines in real time.[25,27,28]

We are aware that there have been publications in Ghana regarding ADE reporting among hospitals, as well as studies assessing patients' willingness to report them, and how they would like to receive feedback from their reports.[28-32] However, little is known regarding the actual extent of ADEs emanating from ambulatory care in Ghana. This is important with the growing burden of chronic diseases managed at outpatient settings in Ghana, alongside an appreciable prevalence of infectious diseases.[12,33,34] Consequently, the aim of this study was to determine the annual prevalence of spontaneously reported ADEs among three outpatient care settings in Ghana using reports generated over 6 years; the rate of occurrence of serious ADEs and possible factors including sociodemographic characteristics, ADE characteristics as well as product characteristics associated with their occurrence. The findings will be used to provide future guidance to key stakeholders in Ghana and wider.

Methodology

Study design

This was a cross-sectional study using data from the Ghana FDA's adverse event forms which had been reported to the National Pharmacovigilance Centre in Ghana.

Sampling size, study site and population

The study was conducted in three outpatient care settings of public hospitals in the Volta Region of Ghana. These included Keta Municipal Hospital (KMH), Ketu-South Municipal Hospital (KSMH) and Hohoe Municipal Hospital (HMH). These three outpatient settings were purposively sampled based on their geographical location and their high utilisation by the populace as they form part of the top five facilities in the Volta region of Ghana with high outpatient numbers per capita as captured by the Ghana Health Service District Health Information Management System Version 2 (GHS DHIMS-2).[35] They also share similar characteristics including the types of services provided and the patient population. The Volta region covers an area of 20,570 km^2 of Ghana with a population of 2118,252 (8.6% of the total population of Ghana) according to the 2010 population census.[36]

KMH is located in Keta, a predominantly urban district in the southern part of the region with a population of 147,618. Keta ranks as the fourth highest district in the region in terms of population after Ho, Hohoe and Ketu-South. Ketu-South Municipality, where KSMH is located, shares a boarder with Lome in the Republic of Togo in the southern part of the region with a population of 160,756. HMH is located in Hohoe Municipality which has a population of 262,046, and ranks as the second most populated district in the region after Ho Municipality. The estimated annual average outpatient attendance for the study period amongst the three settings was approximately 80,600 according to the GHS DHIMS-2.[35]

Data collection

The data were retrieved from duplicates of documented ADEs in the Ghana FDA ADE reporting forms by healthcare providers obtained from patients who spontaneously reported them at outpatients setting between 2013 and 2018 in the three purposively sampled facilities. Incomplete forms that did not have details of the patients' sociodemography, suspected medicine characteristics (such as the date and route of administration and indication for which they were prescribed for) and the description of the adverse events were excluded from the study.

Reported ADEs at outpatient settings are typically first documented onto the reporting patients' medical record by the attending clinician who then refers the patient to the institutional contact person (ICP), who is usually a pharmacist, for further record taking. The ICP interviews the patient reporting the ADE and completes the FDA form thoroughly with information comprising patient sociodemographics, description of the ADE, ADE management intervention, details of suspected and concomitant medicine(s) and lastly information of the ICP. The original copy is sent to the regional representative of FDA in each region and the duplicates are left in the reporting facility. The reports are subsequently forwarded to the National Pharmacovigilance Centre for the purpose of causality assessment by their technical team, after which a feedback report is sent back to the reporting facility.

Data entry and analysis

Data retrieved from the completed FDA ADR reporting forms were entered onto a designed Microsoft Excel template and analysed using Stata version 14 (StrataCorp, Texas, USA). The outcome variable of interest was the seriousness of the ADE, which was defined as any ADE that led to hospitalisation, prolongation of treatment, death or disability in line with previous definitions.[37]

Descriptive statistics analysis was first used to determine the distribution of the reported cases in terms of their gender and age variation.

The annual prevalence of ADE per 1000,000 population was estimated by first determining the number of ADEs retrieved over the 6-year study period to obtain the number of ADEs reported per annum as the numerator. Subsequently dividing the numerator by the average outpatient attendance (80,600) of the three districts where the reports were received according to GHS DHIMS 2. Finally multiplying the results by 1000,000.

A Chi-square test (and where necessary Fisher's exact test) was subsequently used to determine the association of patient characteristics, suspected medicine characteristics and the characteristics of reported ADEs by patient characteristics with the seriousness status of the ADE.

Ethical considerations

Ethical clearance for the study was approved by the GHS Ethics Review Committee with the reference number GHS-ERC010/03/20. In addition, individual patient privacy was ensured by not using direct patient contact details. Alongside this, all the data collected were anonymised and kept in a safe place under lock and key by the principal investigator (IS).

Results

Overall, 93 reported cases of ADE were retrieved from the records of the three selected ambulatory healthcare facilities during the study period, with HMH contributing 46 reported cases, making the most reported cases amongst the three hospitals. KMH contributed 38 reported cases and KSMH contributed with the remaining nine reported cases.

Patients' characteristics for adverse drug events

Of the 93 reported cases of ADE, most were amongst females (77.4%). The mean age of the patients was 42 ± 17 years, with approximately half (44.3%) being above the age of 45 years and relatively few (15.9%) being aged 24 years or below [Table 1]. The median weight of the patients was 58 kg (range: 50–68 kg). Few (28.2%) of the reported

Table 1: Patients' characteristics

Variable	Frequency, *n* (%)	Seriousness of ADE		χ^2	*P*
		Not serious, *n* (%)	Serious, *n* (%)		
Age groups (*n*=88)					
24 years and below	14 (15.91)	6 (42.86)	8 (57.14)	3.7432	0.154
25-44 years	35 (39.77)	22 (62.86)	13 (37.14)		
45 years and above	39 (44.32)	28 (71.79)	11 (28.21)		
Sex (*n*=93)					
Female	72 (77.42)	49 (68.06)	23 (31.94)	1.7449	0.187
Male	21 (22.58)	11 (52.38)	10 (47.62)		
Treatment centre (*n*=93)					
Hohoe Municipal Hospital	46 (49.46)	40 (86.96)	6 (13.04)	28.8267	**0.000***
Keta Municipal Hospital	38 (40.86)	20 (52.63)	18 (47.37)		
Ketu South Municipal Hospital	9 (9.68)	0	9 (100.00)		
Year of report (*n*=93)					
2013	10 (10.75)	2 (20.00)	8 (80.00)	13.1655	**0.024***
2014	14 (15.05)	10 (71.43)	4 (28.51)		
2015	20 (21.51)	12 (60.00)	8 (40.00)		
2016	24 (25.81)	18 (66.67)	8 (33.33)		
2017	13 (13.98)	9 (69.23)	4 (30.77)		
2018	12 (12.90)	11 (91.67)	1 (8.33)		

P values with * were derived using Fisher's exact, *P* values in bold are statistically significant. ADE: Adverse drug event

ADE episode amongst older patients were serious. The facility that reported the least number of ADEs had all the reported cases being serious, with a significant association between the seriousness of ADE and the treatment centre ($P < 0.001$).

Suspected drug responsible for adverse drug event characteristics

The only variable from the suspected drug characteristics that had a significant association with the seriousness of ADEs was the indication ($P = 0.048$) for which the medicine was prescribed [Table 2]. Approximately half of the patients (46.2%) who reported an ADE were being treated for human immunodeficiency viral (HIV) infections; however, most (69.8%) of the reported cases were not serious ADEs. Overall, approximately three out of the four suspected medicines for ADEs were for antimicrobials and most (90.3%) of these were dispensed from the facilities' own pharmacy.

Characteristics of adverse drug events

From the assessment, the annual prevalence rates of ADEs amongst the average population of the three outpatient settings within the study period (i.e., 2013–2018) was 192 ADEs per 1000,000 population. The prevalence of serious ADEs amongst the reported cases was 35.48% (95% confidence interval [CI]: 25.83%–46.09%), with the highest prevalence occurring in KMH (54.55%; $n = 51$) followed by KSMH (27.28%) and HMH (18.18%) [Table 1].

Out of the eight ADE characteristics that were analysed for an association with the level of seriousness of the ADE, only the duration of the ADE ($P = 0.047$), whether treatment was given for the ADE ($P = 0.017$) and the recovery of the patient from the ADE at the time of reporting to Ghanaian FDA ($P < 0.001$) showed any significant association [Table 3]. More than half (57.1%) of the reported ADE cases lasted <7 days' duration and none lasted more than 21 days [Table 3]. The ADEs that lasted more than 7 days were mostly of a serious type. Approximately two-thirds of the reported ADEs required medical treatment at the reporting facility and almost half of the reported patients had recovered from the ADE at the time of reporting to the FDA. More than three out of four of the suspected prescribed medicines were withdrawn within a week of exposure and more than half these led to non-serious ADEs [Table 3]. Approximately two-thirds of the reported ADEs were complaints of dermatological conditions and most of these (59.4%) were not serious.

Discussion

The annual prevalence rate of spontaneous ADE reporting in these three facilities in Ghana was 192 ADEs per 1000,000 population, which falls below the WHO standard of 200 ADEs per 1,000,000 population. However, this was appreciably higher than the 2018 national annual rate of 126/1000,000 population,[25] which may reflect the impact of the FDA activities in this region. Spontaneous ADE reports to the National Pharmacovigilance Centre of Ghana FDA have generally seen an increase in recent years, with more than a 7-fold increase reported between 2013 and 2017 due to educational and other activities. While encouraging, this is still lower than the expected rates.

Our finding of only 93 cases of ADEs reported during the 6-year study period (meaning <16 cases/year) in the three outpatient settings (meaning about five cases per facility per year) providing ambulatory care to over 80,000 attendants per year means that most cases of ADE are still either not being

Table 2: Characteristics of suspected prescribed drug

Variable	Frequency, *n* (%)	Seriousness of ADE		χ^2	*P*
		Not serious, *n* (%)	Serious, *n* (%)		
Class of suspected drug (*n*=93)					
Analgesic	6 (6.45)	6 (100.00)	0	4.5151	0.193*
Antihypertensive	11 (11.83)	6 (54.55)	5 (45.45)		
Antimicrobial	68 (73.12)	44 (64.71)	24 (35.29)		
Others[a]	8 (8.60)	4 (50.00)	4 (50.00)		
Route of administration (*n*=92)					
Oral	81 (88.04)	51 (62.96)	30 (37.04)	0.7571	0.835*
Parenteral	10 (10.87)	7 (70.00)	3 (30.00)		
Rectal	1 (1.09)	1 (100.00)	0		
Source of drug (*n*=93)					
Chemical shop	2 (2.15)	1 (50.00)	1 (50.00)	1.9962	0.439*
Drug peddler	3 (3.23)	1 (33.33)	2 (66.67)		
Hospital pharmacy	84 (90.32)	56 (66.67)	28 (33.33)		
Unknown source	4 (4.30)	2 (50.00)	2 (50.00)		
Prescription status (*n*=89)					
Not prescribed	8 (8.99)	4 (50.00)	4 (50.00)	0.6391	0.462*
Prescribed	81 (91.01)	52 (64.20)	29 (35.80)		
Indication (*n*=93)					
HIV	43 (46.24)	30 (69.77)	13 (30.23)	11.2044	**0.048***
Hypertension	9 (9.68)	4 (44.44)	5 (55.56)		
Malaria	10 (10.75)	6 (60.00)	4 (40.00)		
RTI	6 (6.45)	1 (16.67)	5 (83.33)		
Others[b]	25 (26.88)	19 (76.00)	6 (24.00)		

P values with * were derived using Fisher's exact, *P* values in bold are statistically significant. Other disorders[b] included body pain, ear disorder, endocrine disorder and urological disorders. RTI: Respiratory tract infection, ADE: Adverse drug event

identified or reported by health professionals to the FDA. We believe that this observation still shows a weakness in the patient safety culture among health professionals, which needs urgent addressing. Consequently, more innovative strategies are needed to change this current trend building on the existing FDA activities. This could include the synchronisation of health facility's internal reporting forms with those of national reporting systems to reduce the current workload associated with ADE documentation together. In addition, enhance patients' and healthcare providers' education and awareness of ADE identification, management and reporting. This is because we are aware there can be considerable underreporting of ADEs among healthcare professionals due to lack of knowledge, and these can be addressed through pertinent initiatives.[5,20,38,39] We will be following this up in the future.

The rate of serious ADE was approximately a third (35.48%, 95% CI: 25.83%–46.09%) of the reported cases of ADEs in our study, which is consistent with the high rates of serious ADEs reported by patients in Ghana in previous studies.[17,32] However, our findings are different from other studies among sub-Saharan African countries, which reported very low incidence rates of serious ADEs.[3,18,40]

We also found that the facilities that reported the least number of ADEs had all the reported cases being serious. This could mean that non-serious cases were being underreported by patients; alternatively, healthcare providers may be documenting and reporting mainly serious ADEs to the FDA for further investigation, or a combination of these. Such practices could lead to a situation where several important ADEs which may serve as early signals for investigation by the regulatory authorities before they start causing serious ADRs are being underreported, which is a concern that must be investigated going forward. This is particularly important among sub-Saharan African countries such as Ghana, which are prone to drug–drug or drug–disease interactions due to the double burden of both infectious and non-infectious diseases resulting in potential greater numbers of ADEs.[12,33,41-43] This phenomenon has also been seen in developed countries where patients were more likely to spontaneously report serious ADEs or when they are worried about their symptoms.[44] Consequently, this needs to be addressed with educational and other activities. We are aware that the South African government has introduced core standards to improve patient safety, which includes PV reporting and other activities, which could serve as an exemplar to PHCs in Ghana as well as strengthening the role of pharmacists to help with reporting of ADEs.[45,46] This can be part of government's and general health authorities' activities to improve the quality of prescribing across sectors.[46-48]

The majority of reported ADEs in our study occurred in females, which is consistent with the findings from the monthly drug bulletins of Ghana FDA,[25,27] and from other published

Table 3: Characteristic of adverse drug event

Variable	Frequency, *n* (%)	Seriousness of ADE		χ^2	*P*
		Not serious, *n* (%)	Serious, *n* (%)		
Duration of drug exposure (days) (*n*=69)					
1-7	37 (53.62)	24 (64.86)	13 (35.14)	3.7973	0.153*
8-21	23 (33.33)	9 (39.13)	14 (60.87)		
22-60	9 (13.04)	5 (55.56)	4 (44.44)		
Duration of drug exposure before ADE (days) (*n*=83)					
0-7	72 (86.75)	44 (61.11)	28 (38.89)	4.7391	0.130*
8-21	6 (7.23)	5 (83.33)	1 (16.67)		
22-34	5 (6.02)	1 (20.00)	4 (80.00)		
Duration of ADE (days) (*n*=49)					
1-7	28 (57.14)	16 (57.14)	12 (42.86)	3.9596	**0.047**
8-21	21 (42.86)	6 (28.57)	15 (71.43)		
Onset of dechallenge (*n*=69)					
Early dechallenge (0-7 days)	55 (79.71)	31 (56.36)	24 (43.64)	0.1826	0.669
Late dechallenge (8-21 days)	14 (20.29)	7 (50.00)	7 (50.00)		
Treatment of ADEs (*n*=87)					
Not treated	3 (3.45)	3 (100.00)	0	7.5874	**0.017***
Treated	56 (64.37)	29 (51.79)	27 (48.21)		
Unknown	28 (32.18)	22 (78.57)	6 (21.43)		
ADR effects (*n*=93)					
Dermatological disorder	64 (68.82)	38 (59.38)	26 (40.63)	5.8938	0.143*
GIT disorder	8 (8.60)	5 (62.50)	3 (37.50)		
Musculoskeletal disorder	5 (5.38)	3 (60.00)	2 (40.00)		
Neuropsychiatric disorder	9 (9.68)	9 (100.00)	0		
Other disorders[b]	7 (7.53)	5 (71.43)	2 (28.57)		
Patient recover status at the time of ADE to FDA (*n*=93)					
Not recovered	48 (51.61)	39 (81.25)	9 (18.75)	12.1340	**0.000**
Recovered	45 (48.39)	21 (46.67)	24 (53.33)		
Rechallenge (*n*=81)					
No	68 (83.95)	38 (55.88)	30 (44.12)	3.7701	0.066*
Yes	13 (16.05)	11 (84.62)	2 (15.38)		

P values with * were derived using Fisher's exact, *P* values in bold are statistically significant. Other disorders[b] included body pain, ear disorder, endocrine disorder and urological disorders. ADE: Adverse drug event, FDA: Food and Drug Administration, ADR: Adverse drug reaction, GIT: Gastrointestinal tract

studies.[49-53] However, while some studies have identified female gender as an independent risk factor for ADEs, our study did not show this. This could be due to our low sample size, a limitation we have acknowledged. One reason why gender could be an independent predictor of serious ADEs in the sub-Saharan African countries is that there is typically a higher prevalence of infectious diseases especially HIV among women,[54] accompanied by high anti-retroviral therapy-related ADEs.[55] This is consistent with the high numbers of ADEs in persons living with HIV/AIDs (PLHIV) reported in our study [Table 2].

Approximately half of the reported ADEs occurred in patients aged 45 years and above, which is consistent with several studies that have shown increased prevalence of ADEs among the older age groups,[49,56] although age was not independently associated with serious ADEs in our study. The higher rate of ADEs could perhaps be due to decreased metabolic and excretory functions in the elderly, resulting in reduced drug clearance profiles.

We did find an association between the serious ADE and the type of indication for which the drug was prescribed for ($P = 0.048$). Approximately two-thirds of the patients (73.1%) who reported ADEs were being treated for infectious disease, with HIV being the predominant (46.2%), consistent with the finding that antimicrobials accounted for approximately three out of the four medicines which were suspected of being responsible for the reported ADEs in our study. It is important to note that most (69.7%) of these reported cases were not serious ADEs. This finding is important because anti-retroviral drugs are typically lifelong treatment for HIV and therefore frequent occurrences of serious ADEs could affect patients' confidence in their treatment, leading to non-adherence, which is already a concern in patients living with HIV.[57,58] Clinicians must take cognizance of this by giving continuous education and counselling of possible ADEs with these chronic medications among patients during clinic visits and emphasise the need for early reporting of ADEs for investigation and possible changes to other treatment modalities to sustain retention of medicine use for their HIV.

Our study also found that serious ADEs were associated with the duration of the ADE ($P = 0.047$) and the need to administer treatment at the reporting facility ($P = 0.017$), which were expected as these are the likely outcomes of this type of event. This endorses the need for early reporting of ADEs for investigation and institution of appropriate interventions to prevent permanent impairment, other morbidities or even death, and its negative implication for other associated healthcare costs.[3,5,59] It was encouraging to note that more than three out of four of the reported ADEs had the suspected medicine withdrawn less than a week after their onset, and more than half of these led to non-serious ADEs [Table 3]. This demonstrates the benefit of early reporting of ADEs and the potential for early switching to alternative treatment approaches to avoid serious ADEs. This endorses the need to increase public education and awareness of the value of early spontaneous reporting of ADEs and to create a friendlier clinical environment for patients to promptly report any non-serious ADEs to pertinent healthcare professionals so that mitigation measures can be instigated early to avoid serious ADEs and their consequences. Clinicians must also increase their skills with identifying potential ADEs through, for instance, recognising a patient's new or worsening symptoms or by noticing an abrupt, unexpected discontinuation of any prescribed medicine or sudden abnormal laboratory results, and promptly report this to the FDA. As mentioned, we will be looking to instigate educational and other activities in our hospitals in Ghana in the future to build on these findings and improve future early reporting of all ADEs.

We are aware of a number of limitations with the study. These include the low sample size due to the few outpatient settings that were included in the study. We were also unable to conduct any causality assessment between the suspected drug and the reported ADE to determine whether the reported event was causally related to the suspected offending drug or not. Consequently, more rigorous studies are needed among outpatients in Ghana to determine the possible causes of spontaneously reported ADRs. In the meantime, we believe this cross-sectional study has added to the body of growing knowledge on patient safety issues across sub-Saharan Africa by showing poor reporting rates in spite of the recent measures by the FDA to deal with this phenomenon. In addition, the association between serious ADE and some patient and drug characteristics should be borne in mind by physicians in Ghana when treating patients at outpatient settings.

Conclusion

The annual prevalence rate of spontaneously reported ADEs among our study population in Ghana was low with a rate of 192 reports/1,000,000 population, with a high rate of serious ADE of 35.48%. Serious ADEs were associated with the indication for which the drug was prescribed, the duration of the ADE and the need to administer treatment for the ADE at the reporting facility. There is a need to reduce or remove barriers to spontaneous reporting of ADEs by patients to encourage early reporting to healthcare providers with consequent benefits of reducing ADE-related harm, mortality and costs in the future. Finally, because time and workloads have been identified as barriers to spontaneous ADE reporting in earlier studies, the design of an ADR surveillance programme should focus on ways to overcome these barriers to improve future rates and the timeliness of reporting along with educational initiatives to enhance the rate of reporting. We will be following this up.

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Conflicts of interest

There are no conflicts of interest.

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