Herbal Medicine Associated Casualty And Fatality In South West Nigeria: A Retrospective Analysis

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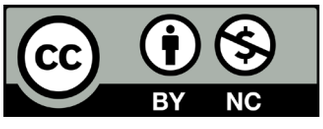

ABSTRACT

Introduction: Several studies have indicated that use of herbal medicines (HMs) in Nigeria and other parts of the world may harm human health. Contamination, adulteration, and the likely presence of toxic constituents in HMs have raised serious concerns regarding their safety. As a result, hospital records in Ekiti state, Nigeria, were analyzed to determine the extent to which HMs contribute to the number of hospital admissions (casualties) and deaths (fatalities) in the area.

Methods: A 5-year (2010 to 2014) retrospective analysis of patient data was carried out by examining HM-associated paediatric, adult medical, and obstetric casualty and fatality figures. The findings were then triangulated with available secondary data.

Results: During the studied period, out of 23,363 pediatric cases, 0.5% of casualties and 3.2% of fatalities were associated with HM use. Similarly, among 52,871 adult cases, 0.06% of casualties and 0.2% of fatalities were linked to HM use. Of the 668 obstetric stillbirth cases, 3.9% involved the use of HM. The highest number of casualties and fatalities were observed in male patients aged between 30 to 49 years, who were Christians and self-employed.

Conclusion: While the number of deaths associated with HM is relatively low, the possible complications that can arise from its use make it necessary to test and promote awareness of possible dangers of HM use to prevent hospitalizations and fatalities. Better awareness and documentation of patients' HM use by healthcare providers will help gain a better insight into their usage.

Keywords: Casualty, Fatality; Herbal medicines; Primary Health Care.

INTRODUCTION

Herbal medicines (HM) contain various pharmacologically active compounds and the constituents responsible for the therapeutic effect are sometimes unknown.[1] HM are generally considered to be effective and a safe form of medication. Therefore, there is regular patronage of HM because it is believed that plant-derived remedies are devoid of undesirable side effects.[2] Although there are some reports on the adverse effects of HM, other studies indicated a limited number of severe clinical reactions. [3, 4] Therefore, more detailed studies are needed in this field. It is important to highlight heavy metals such as selenium, thallium, arsenic, and others have been detected in some herbal products in Nigeria[5] and other forms of HM around the world.[6] Therefore with their associated potential toxicity, the amount of heavy metals present in HM also needs to be researched. Neural tube defects and anencephaly in babies and renal impairment in adults due to mercury, lead, cadmium, and arsenic toxicity from various environmental exposures have been reported [7]. In southwest Nigeria, cases of acute renal failure associated with uncertified herbal medicine use and consequent fatalities were reported, though the particular component

of the HM responsible for the damage was not mentioned.[8] or perphas unknown. In addition, traditional HM-related liver fibrosis has been reported in Uganda.[9] In Ekiti state, Nigeria, HM-related fatalities were reported in two children.[10] The constituent of the HM responsible was not reported, but the presence of pharmaceutical compounds, heavy metals, toxic phytochemicals, and others may have contributed.

Therefore, interdisciplinary research has been conducted where survey methods drawn from public health were used to explore knowledge and experience of herbal medicine use in Ekiti State, Nigeria. Based on survey findings, the authors collected 10 commonly reported HM and analyzed them for the possible presence of undeclared pharmaceutical compounds and heavy metals.[11] Some heavy metals such as cadmium and copper were detected above the World Health Organisation (WHO)'s permissible limits in all the samples studied whereas lead and zinc were present above the limit in one of the samples analyzed. None of the suspected undeclared pharmaceuticals were present. These findings informed the need to conduct a hospital-based study in the same area to assess casualty and fatality figures associated with the use of HM.

METHODS

The HM-related causality and fatality figures were studied in Ekiti state, over 5 years (January 1, 2010 to December 31, 2014). Retrospective records of patients admitted into female and male medical wards, children emergency wards, and records of obstetric deliveries in the Ekiti State-owned 16 specialist and general hospitals and 1 tertiary hospital were used. These wards are focal points in the hospital for admissions of adults, children, and pregnant women, hence forming a large pool of suspected cases of interest in this study. 94,323 patient records were examined and accessed through available data on the wards, from nurses' report books, and case notes retrieved from the hospital's medical records department. Data was also obtained from the state hospital management board.

The search criteria used in this study included admission and death due to: (i) poison agents, (ii) herbal intoxication, and (iii) herbal medicine use. Only deaths and admissions that were certified or highly suspected to be a result of HM use or its intoxication by the attending physician were included in this study. A review of obstetric records of patients was conducted and stillbirth (SB) was identified and used for this study. SB was defined as the birth of a baby with a birth weight equal to or greater than 1kg, of 28 weeks gestational age or more, or a body length of 35 cm or more, who died before or while in labor.[12] Data were obtained from the SB case files of patients with maternal exposure to HM in pregnancy. The data obtained included maternal age, level of education, religion, occupation, and probable cause of SB based on Baird-Pattinson's classification. This includes (i) foetal abnormalities, (ii) antepartum haemorrhage; (iii) unexplained intrapartum fetal death; (iv) intrapartum related infection; (v) hypertensive disorders; (vi) maternal diseases; (vii) spontaneous preterm labour (SPL); (viii) intrauterine growth restriction (IUGR) and others.[13] Unknown causes of death, fetal abnormalities, IUGR, SPL, and unexplained intrapartum fetal death were identified and examined for history of HM use in pregnancy.

The data obtained from hospital records were analyzed by descriptive statistics using Statistical Software for the Social Sciences (SPSS) package version 20.0. This statistical package was used to compare the socioeconomic characteristics of adult patients and their outcomes. These findings were then triangulated with available secondary data and our survey findings.[11] Ethical approval was obtained from the Hospitals' Management Board, Ekiti State, Nigeria (Ref. No. P.522202/52) and Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria (EKSUTH/A67/2015/09/002), to access patient's data regarding casualty and fatality associated with herbal medicines.

RESULTS

A five-year retrospective study of casualties and fatalities related to HM from 17 government hospitals (2010-2014) resulted in 94,323 patient records of interest based on the search criteria stated in the method section. A total of 167 patient records were eventually used in this study. They were records with HM use or highly suspected HM use or its intoxication resulting in casualty or fatality by the attending physicians. 64.07% (n=107) of the records were pediatric, 20.36% (n=34) were adult-related and 15.57% (n=26) were obstetric hospital admissions.

Casualties and fatalities linked to HM in paediatric cases

In general here were 1,146 death cases from 23,363 pediatric hospital admissions over that 5 years period, of which 0.5% (n=107) were herbal medicine-related pediatric admissions and of that total, 3.2% (n=37) were HM-related pediatric death. Herbal medicine-related medical admission was only 0.06% of the total adult medical admission (n=52,871) over the 5-year study period and related death of 0.2 % of the total deaths recorded (n=1,964) (Figure 1).

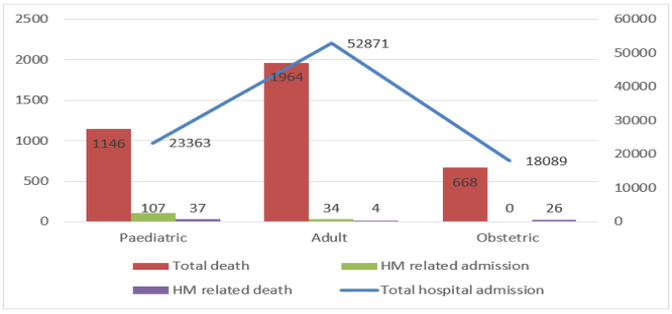

Figure 1: Graphical representation of pediatric, adult and obstetric hospital admissions and death against HM related admissions and death case

Casualty and fatalities linked to HM in obstetric cases

Obstetric fatalities related to HM use in the form of stillbirth (SB) were 26 (3.9%) of the total 668 stillbirths. History of HM use in pregnancy was identified within four Baird-Pattinson classifications for stillbirths which include; spontaneous premature labor SPL (11 cases, 42%), fetal abnormalities (9 cases, 34%), IUGR (4 cases, 15%) and unexplained intrauterine fetal death (UIFD) (2 cases, 8%) (Figure 2).

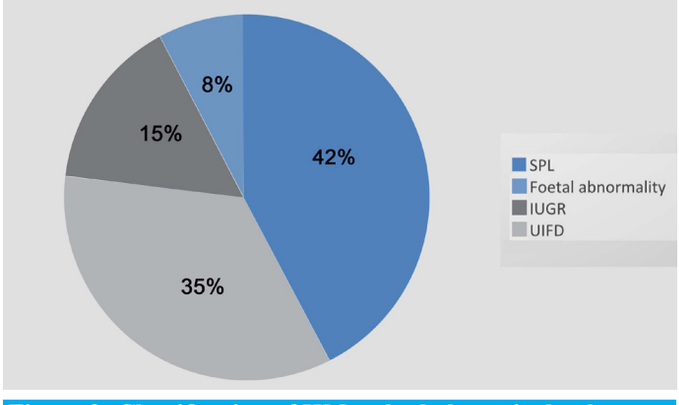

Figure 2: Classification of HM- relted obstetric death cases

Casualty and fatalities linked to HM in adult cases: socio-demographic characteristics

Soicio- demographic chracteristics of the adult casualty and fatality figures from this study showed the highest casualty among the age group 30-49 years, male patients, patients with a primary level of education, Christians, and patients who were self-employed (Table 1). The fatality was also highest among the age group 30-49 years.

Table1: The sociodemographic characteristics of herbal medicine associated with adult casualty and fatality cases

Socio demographic characteristics	Outcome		Total (n=34)
	Survived n=30 Casualty	Died (n=4) Fatality	
Age/years			
18-29	4	0	4
30-49	16	3	19
50-69	7	1	8
70 and above	3	0	3
Gender			
Male	27	3	30
Female	3	1	4
Level of Education			
No formal education	0	0	0
Primary	13	1	14
Secondary	10	1	11
Tertiary	7	2	9
Religion			
Christianity	25	2	27
Islam	4	1	5
African Traditional religion	1	1	2
Occupation			
Student	2	0	2
Civil servant	0	2	2
Farmer	1	0	1
Self-employed	25	2	27
Others	2	0	2

DISCUSSION

In a previous 4-year retrospective study carried out in a tertiary hospital in Ekiti state SouthWest Nigeria, 0.3% of the total pediatric admissions (n=5,256) were as a result of HM use with two deaths recorded.10 The HM-related pediatric casualty in this study (0.46%) is higher than the previous study (0.3%). However, in this study, HM related casualty and fatality in adult patients were lower than the pediatric figures at 0.06% and 0.2% respectively. Although about 25% of the respondents who experienced adverse effects after taking HM indicated that they visited the hospital for treatment of the effects[11] this is not corroborated by the 0.06% of the medical admissions being HM related found in this study. A possible explanation for this could be that some patients do not disclose the use of HM to doctors in the hospital.[14-17]

In addition, doctors have also been reported to underestimate the use of HM by patients and therefore do not always ask about it when taking clinical history from the patients.28 These factors may have affected the admission data which is significantly lower than the findings from the prior survey.[11]

Several publications have reported HM-related casualties and fatalities.[19-21] An example is the Nigerian study which reported that of the 218 patients who attended a fertility clinic in a tertiary hospital with abnormal seminal fluid analysis, 84% had a history of HM use.[22] This shows that a vast number of patients are already using herbal medicines although at the point of hospital admission HM use may not necessarily be revealed until further examination. However, when there are severe adverse effects of the HM use, often patients are likely to disclose this information as well as doctors exploring their use. The use of HM among pregnant women is common in Nigeria[23-25] however the therapeutic or toxic effects vary between idividuals. This study showed that 3.9% (26 cases) of the total stillbirths over the 5 years (n=668) were associated with HM use. The majority of these fatalities were linked to SPL (42%) and fetal abnormality (34.5%) whereas IUGR and UFID contributed to 15% and 7.7% respectively. These fatalities could be a result of direct or indirect toxicity of HM through their misuse, contamination (e.g. with heavy metals, pesticides, etc.), and adulteration (e.g. with active pharmaceutical compounds) when used during pregnancy.

A study has shown intrapartum use of HM in healthy babies.[26] while other studies have reported fetal abnormalities in babies exposed to HM in utero.[27-30]. Also animal model studies have shown HM-induced IUGR and fetal abnormalities.[31,32] HM-associated stillbirth has been previously published[34,35] and a 3-year retrospective study in Ghana reported HM to be associated with 5.7% of the total stillbirth cases.[35] which is higher than the 3.9% observed in this study. Like the adult and pediatric HM-related casualty and fatality data in this study (where the diagnosis was made as HM-related), in the obstetric setting other factors such as age, the quantity ingested, nature of HM, and underlying medical condition could have confounded the outcomes. However, the hospital records used in this research only pointed towards the use of HM as confirmed or highly suspected by the attending physician to have been the cause of mortality or fatality. Therefore using a control group may be useful in drawing stronger inferences to understand the outcomes as a matter of further research. Comparison of the socio-demographic characteristics of HM users from previous studies.[11] and that of HM-related casualty (Table 1) showed that the age group 30-49 years had the highest casualty and fatality. The fatality figures within the age range of 30-49 years were a relatively small sample size (3 cases). Due to this, no further comparison of fatalities data could be made. This finding reveals perhaps how involved this age group is in HM use, despite the concerns about the health consequences. It identifies a potential target group for future HM -related policies and awareness programs. Similarly, Aina (2018)[11] reported that amongst the 1,075 participants, more males (89.9%) used HM than females (78.6%) which may be responsible for the higher casualty and fatality figures observed in men. (Table 1)

People who practiced African traditional religion had the highest fatality of those admitted based on religious affiliation, although they had the lowest casualty (sample size was low, 2 cases). African traditional religion is the epicenter of HM practice[36] its worshiper's belief in HM is also sacrosanct. As a result, they are likely to use more HM and probably use other HM to counteract the undesirable effect of another; the efficacy of such practice may be responsible for the low casualty recorded when it is successful and the cumulative damage when it fails may be responsible for the high fatalities recorded when they eventually presented in the hospitals (Table 1). However, this needs further evaluation.

CONCLUSION

The percentage of HM-associated casualty and fatality figures were small compared to other diseases treated in the hospitals. But then, there are possibly medical conditions that may be directly or indirectly linked to using HM. If further scrutinized, perhaps may of the other medical conditions forming the bulk of casualty figures in the medical records examined maybe attributed to exposure to adulterants, contaminants, or naturally present toxins in HM and other confounding conditions. The effect of HM seems to be downplayed considering other important causes of medical conditions; so doctors probably don't specifically ask about HM use from patients. Conversely, the benefit of HM cannot be underestimated as many reports have highlighted this fact. HM remains a growing and popular alternative to conventional medicine, however, its safety needs to be constantly monitored which forms the basis of further research.

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