

Systemic Analysis of Sudden Natural Deaths at Braithwaite Memorial Specialist Hospital Port Harcourt, Nigeria

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ABSTRACT

Background: Many cases of sudden unexpected natural deaths occur in individuals without known medical diseases. Relatives of such victims and the law enforcement agents often designate those as sudden and unnatural deaths (SUD), and call for coroners inquests.

Aims: To analyze the anatomic causes of sudden natural deaths investigated by the Coroner at Braithwaite Memorial Specialist Hospital (BMSH), and to classify them according to body systems and compare our findings with those of previous studies.

Materials and methods: This is a nine-year retrospective study carried out in BMSH Port Harcourt, Nigeria. The reports of unlimited and standardized autopsies carried out on sudden and natural death victims were retrieved and analyzed. The causes of death were grouped according to the body systems involved. The cases were also analyzed according to age, sex, and circumstances of death.

Results: Of the 9,164 bodies received, 2,415 (26.4%) were autopsied for varied reasons, out of which 249 (2.7%) were sudden natural deaths in persons without known significant medical history. Male: female ratio (MFR) was 2.2:1. The mean age was 39.7 years with a range of 3 weeks to 97 years. Peak age group was 30-39 years with 27.7%. Cardiovascular system pathologies were by far the commonest causes of death with 87.6%. The least cause of death was prematurity with 0.4%. Among the cardiovascular system pathologies, hypertensive heart disease was the commonest. All deaths were from natural causes.

Conclusion: Cardiovascular system pathologies especially hypertensive heart disease remain the leading cause of sudden natural deaths in this study. Residents of Rivers state of Nigeria should be more conscious of their health and undergo regular medical check-ups for early detection and proper management of cardiovascular diseases especially systemic hypertension.

Key Words: Sudden natural deaths, autopsy, coroner, hypertension, Port Harcourt.

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INTRODUCTION

Sudden unexpected, natural death in an apparently healthy individual is common globally. This event is not only tragic to the deceased relations and of concern to the coroner but may also have some predictive genetic implications for the surviving relatives. Studies have shown that careful clinical evaluation of relatives of sudden death victims of age <40 years have familial arrhythmic syndromes in 22-50% of cases.¹⁻³

Cardiovascular diseases remain the leading cause of death for adult blacks and whites in the United States,⁴ with whites being more prone to atherosclerotic related mortality than blacks, who in turn show higher risk to hypertension related mortality⁵. Escofery⁶ observed cardiovascular accidents as the commonest cause of natural deaths in Jamaica. In children and adolescents, causes of sudden natural deaths are diverse with cardiomyopathy as a common cardiac cause⁷⁻⁹. Consequently, the prevention of sudden death in the young is difficult. Intracranial hemorrhage and deaths from respiratory and infections causes have also been reported, among children and adolescents^{10, 11}. Benito⁹ reported sudden deaths in children and adolescents as constituting 9% of all non-violent deaths, while Driscoll¹² and Molander¹³ reported 2.3% and 8.2% respectively.

Various reports have consistently demonstrated that males are at higher risk for non-violent SUD than females^{9, 10, 12, 14}. Most studies that dealt with sudden natural deaths were limited either by age limitation or circumstances of death specification with few looking at the entire spectrum of circumstances of death and age of victims. There has also been paucity of reports of sudden non-violent deaths in Nigeria and none to the best of our knowledge from Rivers state- the hub of the oil-rich, Niger Delta region of Nigeria¹⁵⁻¹⁷.

This study was therefore embarked upon to analyze the causes of sudden natural deaths, autopsied in BMSH in nine years across all age strata and circumstances. It will also be of benefit to clinicians, pathologists and coroners in preventing and predicting causes of sudden non-violent deaths in BMSH.

MATERIALS AND METHODS

A retrospective analysis of coroners' autopsy findings in patients without known medical diseases, who died suddenly and non-violently and were autopsied in Braithwaite Memorial Specialist Hospital (BMSH) between March 2000 and February 2008, was undertaken.

For each case, an unlimited and standardized autopsy was performed. Tissues were taken for histologic and toxicologic analysis of some cases. Authorized reports were duly issued with the duplicate copies preserved by the pathologist. The duplicate reports of all cases that died suddenly and non violently and who did not have previous known illnesses prior to death were retrieved for analysis with respect to gender, age, circumstances of death and autopsy-defined cause of death. The findings were broadly classified into the physiologic systems primarily responsible for death process in each case. BMSH, which is the setting for the study is the fore-most among the Rivers state government owned general hospitals. It is located in the residential area of Port Harcourt, the state capital and serves both secondary and tertiary health care needs of the city residents. Autopsies are conducted routinely, both on in-patient and out-patient referral basis in the facility.

RESULTS

Between the years 2000 and 2008, a total of 9,164 bodies were received at the BMSH mortuary out of which autopsies were generally conducted on 2,415 cases (26.4%) for medical and medico legal reasons. Two hundred and forty-nine (2.7%) of the general autopsies were carried out on account of sudden unexpected non-violent deaths. One hundred and seventy cases (68.3%) were males while 79 cases (31.7%) were females, giving male to female ratio of 2.2:1.

The average age of the victims at death was 36.8 years while the range was 3 weeks to 97 years. Adults of age range 20-49 years were the most affected with 175 cases (70.3%). Of this, men and women in their third decades of life constituted the peak age, with 69 cases (27.7%) followed by those in their fourth and second decades, with 56 cases (22.9%) and 50 cases (20.0%) respectively. Also fifth and sixth decades reasonably contributed to SUD(s) with 28 cases (11.2%) and 25 cases (10.0%) respectively. Children and adolescents recorded only 14 cases (5.5%) while with 7 cases (2.8%) the elderly

The commonest causes of these deaths were cardiovascular system related, with 218 cases (87.5%). It included hypertensive heart disease, myocardial infarction, stroke, cardiac rupture, and coronary atherosclerosis with thrombosis. Lymphoreticular and Hematopoietic system pathologies were next with 11 cases (4.4%). They consisted of 7 cases of malaria and 4 cases of sepsis. Respiratory system disorders followed with 9 cases (3.6%). Other system accounting for sudden natural deaths in descending order were: genitourinary system causes with 5 cases (2.01%), gastro intestinal system causes with 3 cases (1.2%) and central nervous system causes with 2 cases (0.8%). Prematurity was the least cause with 1 case (0.4%).

Table 1: Causes of Death By Systems

Cause of death by system	No	%
Cardiovascular	218	87.55%
Central Nervous	2	0.80%
Respiratory	9	3.61%
Gastrointestinal	3	1.20%
Urogenital.	5	2.01%
Lymphoreticular	11	4.4%
Prematurity	1	0.4%
TOTAL	249	100%

Table 2 Age Distribution

	AGE								Gender		TOTAL
	10-19	20-29	30-39	40-49	50-59	60-69	70-79	>80	MALE	FEMALE	
2000	1	5	1	4	3	1			6	9	15
2001	1	3	6	8	3	3	1	1	19	7	26
2002	2	5	10	6	2	5			18	12	30
2003	2	6	5	3	5	1			18	4	22
2004	1	7	8	9	2	1	1	1	20	10	30
2005	1	7	9	7	3	1	1		22	7	29
2006		6	11	4	3	5			21	8	29
2007	1	7	10	10	4	1	1		22	12	34
2008	5	4	9	5	3	7	1		24	10	34
TOTAL	14	50	69	56	28	25	5	2	170	79	249

DISCUSSION

The autopsy rate for the period under review in BMSH is 26.4%. This is lower than the 36.2% reported at Ibadan South West of Nigeria by Amakiri et al¹⁸. This low rate, which was also acknowledged in an earlier 30-year review by Akang et al¹⁹ in the same setting is in keeping with the global trend of decline in autopsy rate. Accurate mortality statistics is derivable from autopsies and essential for public health monitoring and health service planning²⁰. A recent study²¹ noted that most relatives (62%) do not have satisfactory knowledge about autopsy. Doctors identified difficulty in obtaining consent from relatives of deceased patients, administrative problems in requesting autopsy and delay in obtaining autopsy reports as major reasons responsible for the decline in autopsy requests, whereas relatives of deceased persons cited fear of mutilation of body, concerns about delaying funeral, and objection by the patient before death as reasons for refusal to grant permission for autopsy. However considering the role of autopsy in the development of the science and practice of medicine, combination of efforts by relevant stake holders towards resuscitation of autopsy practice is imperative.

About 3% of all autopsies were medico-legal cases performed on account of perceived sudden unexpected natural deaths. This rate is very low compared with figures from other Nigerian studies, which range from 27.3¹⁶, to 55.6%.^{18, 21}. The reported rates of 39.9% and 51.3% in Thailand²² and Jamaica⁶ respectively are also higher than our figure. Although rate of autopsies performed on account of sudden unexpected natural deaths in this study is low, there is wide variation in the figures reported by other scholars as cited above. The possible reason for this variation as given by Benito⁹ in a study in Spain is that the definition of sudden death is not uniform, both by chronological criteria and by the inclusion or exclusion of patients with known previous illnesses. Our study involved victims who did not have known significant past medical history.

Sixty eight percent of the victims were males with M:F ratio of 2.2:1. This ratio is within the wide range of 1.2:1 to 6:1 obtained from previous similar studies carried out in Nigeria¹⁷⁻¹⁹. In Jamaica, Escofery⁶ observed 1.2:1 while a review of autopsy studies conducted in America and Europe reported M:F ratio range of 1.1:1 to 4.7:1. It is note worthy that in all autopsy studies cited; there was a preponderance of male victims over females. Some researchers have stated that males are generally at increased risk for sudden deaths than females.^{10,12,14,23}

The age range of victims was 3 weeks to 97 years with an average of 36.8 years. The wide age range is similar to reports by Amakiri et al¹⁸ and Mandong et al¹⁷ in their separate studies in Western and Northern parts of Nigeria respectively. In addition, the average age is comparable to Mandong's finding of 34.7 years but lower than the 53.7 years reported in Jamaica by Escofery⁶. Moreover, Amakiri et al observed 4th decade as peak age of sudden unnatural deaths. The 36.8 years average age and peak age group of 3rd decade observed in this study as well as the mean age reported by other authors cited are in keeping with the low life expectancy in Nigeria. While the average life expectancy of the world is 67.2 years, that of Nigeria as at 2005-2010 is 46.94 years. According to United Nations, the value of life expectancy for a country reflects the quality of health care as well as other factors such as ongoing wars and HIV/AIDS. In Nigeria low life expectancy is attributable to poor healthcare quality, manifesting as ill equipment of healthcare facilities, poor remuneration of workers with incessant industrial actions and lack of adequate training and retraining of personnel. The governments at the various levels need to improve on the funding level of healthcare in order that the current low life expectancy in Nigeria will improve. The peak ages of Nigerian series, including this study also hold grave socioeconomic consequences to the nation. The sudden loss of apparently well and productive members of the society implies general economic loss to the nation. These deaths will cumulatively reflect negatively on the nation's Gross domestic product (GDP). Socially, the loss of such category of societal members, most of who are males create strong social responsibility vacuum in families that may result in improper training of children. This stems from the likely consequence of discontinuation of academic pursuits by the children of some of the deceased as well as other dependants due to lack of funding, which effectively adds to societal burden of social vices, and illiteracy level.

Children and adolescents constituted only 5.6% of the cases. This is comparable to the 4.5% recorded by Odesanmi²⁴ in Ile-Ife, south west of Nigeria but lower than the 10.4% recorded by Amakiri et al. However, that children and adolescents constituted 5.6% in this study is noteworthy considering that most African series reported road traffic accidents as the commonest causes of sudden deaths among the young²⁵⁻²⁸.

The commonest causes of deaths in this study were cardiovascular system (CVS) related with 87.6%. Hypertension and its associated complications of stroke and sudden cardiac death from hypertensive heart disease constituted 96% of the cardiovascular deaths. Four percent of

the CVS deaths were due to complications of arteriosclerosis including myocardial infarction. The overwhelming predominance of hypertension in this study is comparable to the 82% hypertension reported by Rotimi et al¹⁵ in an analysis of sudden unexpected deaths from cardiac causes in Nigeria. This observation is also in keeping with other previous autopsy reports^{6,16,18,21,22}. A study reported cardiovascular diseases as the leading cause of death in the United States, with whites being more prone to atherosclerotic related mortality than blacks who show a higher risk to hypertension related mortality⁵. The interaction of poverty with race is stated to play an important role in contributing to excess cardiovascular mortality among blacks living in impoverished urban areas in the USA^{29,30}. In Nigeria, beyond racial predisposition, the physical, emotional and financial stress unleashed on the populace by the overall poor socioeconomic conditions, low standard of living, high rate of unemployment, decayed social infrastructure, and high sense of insecurity may account for the high prevalence of hypertension. This is also worsened by the fact that hypertension is commonly asymptomatic till complications set in.

Myocardial infarction being uncommon in this study is consistent with the literature documentation that while myocardial infarction is the commonest cause of sudden natural deaths in the developed countries of Europe and America,^{31,32} the incidence is low in developing countries-^{5,15,17,33,34}

Hematopoietic system causes including sepsis in HIV positive victims and Malaria with (4.4%), was the second commonest cause of natural deaths. Infectious diseases especially HIV remain a high disease burden to Nigerians. Deaths resulting from the complications of HIV/AIDS are potentially preventable if proper awareness was created by government and practiced by the victims. The deaths could also be the negative consequence of stigmatization as some patients would not attend HIV clinics where drugs are given either free or at subsidized cost. The possible reason for abstaining from the clinic is avoidance of identification as HIV positive patients.

Respiratory system pathologies including pneumonias, and chronic obstructive pulmonary diseases were the next causes of sudden natural deaths by frequency in this study, with 3.61% occurrence rate. Although the proportion of respiratory system pathologies is lower, it is consistent with reports by Amakiri et al¹⁸ in UCH Ibadan and Odesanmi in Ife²⁴.

Deaths resulting from reproductive system pathologies in this study including ruptured tubal and uterine gestations which constituted 2% call for concern as they are potentially preventable if the clinical conditions were properly managed. Studies have shown high maternal mortality in Nigeria.^{35, 36} Overall, an improvement of the quality of health care in Rivers state will reduce preventable deaths especially from respiratory and reproductive system pathologies.

Central nervous system pathologies and prematurity were also uncommon in this study. Retrospective analysis of

autopsy data as in this study is limited by imprecise documentation of some cases especially since it has been ascertained that death was due to natural causes, attention to subtle distinctions among etiological causes may have lacked in some cases.

CONCLUSION

Cardiovascular system pathologies especially hypertensive heart disease remain the leading cause of sudden natural deaths in this study.

Residents of Rivers state of Nigeria should be more conscious of their health and undergo regular medical check-ups for early detection and proper management of cardiovascular diseases especially systemic hypertension.

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