Journal of Experimental Research

June 2018, Vol 6 No 2

Email: editorinchief.erjournal@gmail.com
editorialsecretary.erjournal@gmail.com

Received: *March. 2018*
Accepted for Publication: *May, 2018*

Paediatric Mortality and Autopsies in Enugu State University Teaching Hospital, Esuth/Parklane, Enugu, Nigeria: A 5- Year Review.

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ABSTRACT

Autopsy has traditionally been the criterion for determining cause of death and has played a major role in medical education and quality control. World over autopsies are carried out to determine cause(s) of death or to confirm the pathological processes that were suspected to be deranged prior to demise. They are relevant in guiding genetic counseling and helping families that are grieving. Despite these uses and applications, autopsy rates have declined globally. This study was undertaken to identify the in-patient mortality and autopsy rate in children at the Enugu State University Teaching Hospital ESUTH/Parklane, Enugu Nigeria. The report is a retrospective review of all the deaths among the hospitalized children from 1st January 2013 to 31st December 2017. Relevant information was extracted from the hospital records of all paediatric in-patients. Autopsy reports of all paediatric autopsies were pulled from the Histopathology department of ESUTH/Parklane. Information extracted from the autopsy reports and the hospital records were recorded in the proforma. Out of 11,570 children that were admitted during the period under review, 786 (6.79%) paediatric deaths were recorded, of which 423 (53.8%) were males and 363 (46.2%) were females; giving a male: female ratio of 1.17: 1. Out of the 786 in-patient paediatric deaths, only 3 (0.4%) autopsies were conducted. We concluded that despite the importance of autopsies, paediatric autopsies are not routinely performed in our environment and new strategies are needed to increase autopsy rates.

Keywords: Paediatric, Autopsy, Mortality, In-patient.

INTRODUCTION

Autopsy has traditionally been the criterion for determining cause of death and has played a major role in medical education and quality control (Kumar et al. 1998) World over autopsies are carried out to determine cause(s) of death or to confirm the pathological processes that were suspected to be deranged prior to demise. In a good number of autopsies, new diagnoses, different from the ante-mortem diagnosis, are made, which if known before death, would likely have resulted in a change in treatment or improved survival (Kumar et al. 1998). Due to a number of reasons such as emotional attachment to death of a loved one, religious and socio-cultural beliefs and practices, lack of understanding of the usefulness of autopsies amongst many other reasons; caregivers rarely give up their dead particularly children for autopsies. In the developed world, with increasing use of bedside technology, autopsy rates have steadily declined despite the fact that studies have shown that autopsies continue to be useful in medical practice (Kumar et al. 1998, Kumar et al. 2000). Paediatric autopsy particularly continues to provide clinically significant data and remains a valuable tool in modern paediatric practice (Stammbouly et al.1993, Kumar et al.1998, Kumar et al.2000, RCPAAWP 2004, Buckner et al. 2006, Feinstein et al. 2007). Autopsies could be categorized as either hospital (clinical) autopsy or coroner (forensic/medico-legal) autopsy (Kotabagi et al. 2005). In hospital autopsy, the disease causing death may be known, but the course to death is not known (Kotabagi et.al. 2005). Hence the purpose of the hospital autopsy would be to determine the extent of the disease and/or the effects of therapy and the presence of any undiagnosed disease that might have contributed to death (Kotabagi et.al. 2005). Additionally, the next of kin must give permission (consent) for the autopsy and may limit the extent of the dissection

(Kotabagi et.al. 2005). In forensic (medico-legal) autopsies, the autopsy is ordered by the coroner or medical examiner as authorized by law with the statutory purpose of establishing the cause of death and answering other medicolegal questions. The next of kin is not required to authorize and may not limit the extent of the autopsy (Kotabagi et.al. 2005).

Autopsy rates could be as high as 100% in developed areas of the world especially from 5years of age and above but this may be different in the developing countries and may be affected by age with the younger age groups having less autopsies (Kumar et al. 2000).The pattern of findings from autopsies in the developed world reveal that they have higher percentages of congenital abnormalities, oncological cases and nonbacterial infections as the cause of death. This may not be the case in the developing world. In Nigeria, despite the poor technological advancement laced with high disease burden and mortality, autopsy rates appear to be low and declining (Akang et al. 1992, Eke et al 2001, Ayoola et al. 2005, Oluwasola et al. 2007, Ugiagbe et al. 2012, Nwafor et al. 2014). Socio-cultural and religious beliefs negatively affect the willingness of caregivers to offer consent. In addition, health worker related factors such as delays in the pathology laboratory and apathy to request autopsies also contribute to low autopsy rates.

This study was conducted to find out the paediatric mortality and autopsy rate in ESUTH Parklane, a University Teaching Hospital, covering the entire Enugu State, South East Nigeria. It is hoped that the findings may be useful in reawakening the consciousness of healthcare practitioners on autopsy gaps and stimulate discussions on new approaches to increase autopsy rates and yields and by extension, our understanding of diseases.

MATERIALS AND METHODS

Background/Setting: This study was conducted in ESUTH Parklane in Enugu State, South Eastern Nigeria. Autopsy records from Pathology department were obtained and all paediatric autopsies over a five- year period (1st January 2013 to 31st December 2017) were retrospectively reviewed. Hospital records from 2013 to 2017 were obtained and relevant data extracted including number of admissions, number of deaths and gender. Total number of deaths in the peadiatric department of the hospital over the same period was ascertained from the records of the different units of the hospital- Children ward, Children Emergency Room and New Born Special Care Unit. Mortality rate was calculated using the number of deaths expressed as a percentage of the number of children admitted. In-patient autopsy rate was calculated as the total number of in-patient autopsies expressed as a percentage of the total number of deaths.

Health Research Ethics Committee of ESUTH/Parklane approved the study. Data was collected with the aid of a questionnaire designed for the study. The statistical analysis was basic descriptive statistics.

RESULT

Out of a total of 11,570 admissions, 786 deaths were recorded during the period under review (1st January 2013 - 31st December 2017) with death rate ranging from 5.88% to 7.90%. See table 1.

Table 1: Total admissions and deaths 2013 – 2017.

YEAR	TOTAL ADMISSIONS (N)	TOTAL DEATHS (N)	DEATH RATE (%)
2013	2128	128	6.02
2014	1652		7.63
2015	2189	173	7.90
2016	2566	151	5.88
2017	3035	208	6.85
TOTAL	11570	786	6.79*

*Average death rate

Of these 786 total deaths, 423 (53.8%) were males and 363 (46.2%) females, giving a male: female ratio of 1.17:1. Three hundred and twelve (39.7%) of total death recorded in the period were amongst newborns while three hundred and sixty four (46. 3%) and one hundred and ten (14.0%) of the total deaths were recorded in the children emergency room and children's ward respectively.

Out of the seven autopsies done within the five-year period, 3 (42.9%) were on in-patients (hospital autopsies) while 4 (57.1%) were medico-legal (Forensic). Out of the total of 786 in- patient paediatric deaths recorded during the period under review, only 3 (0.4%) in-patient autopsies were conducted. All three in-patient autopsies were on neonates while the four forensic autopsies were in older children. The three hospital autopsy findings revealed that the causes of death were Disseminated Intravascular Coagulopathy from sepsis; congestive heart failure from multiple congenital anomalies (including congenital heart disease); and Respiratory Distress Syndrome. The four forensic autopsies identified causes of death as strangulation; aspiration; multiple organ failure from sepsis; and septicaemia in a patient with Acquired Immune Deficiency Syndrome.

DISCUSSION

Relative to the developed world, there is a high in-patient death rate in tertiary hospitals in sub-Saharan Africa and other developing parts of the world. While Zhu and colleagues (2015) recorded two hundred and thirty deaths out of 43,925 admissions (death rate of 0.5%); this study recorded an average death rate of 6.79%. Similar high death rates were also reported by Eke et al (2001) in Port Harcourt and Ijezie et al (2015) in Uyo all in Nigeria. Again, a higher male death rate compared to females was noted in this study. This finding was also observed by Ijezie et al in Uyo (2015). Balsara et al (2013) using mortality data for all deaths in children from the Centre for Disease Control and Prevention's WONDER database (1999 – 2008) also made a similar observation. The reason(s) for the higher male death rate in children is unclear but could be related to the male hormonal and genetic makeup (Balsara et al. 2006).

This study revealed a relatively low paediatric in-patient autopsy rate. Similarly low autopsy rates were also obtained in studies in Port-Harcourt (Eke et al. 2001), Benin (Ugiagbe et al. 2012), Umuahia (Nwafor et al. 2014), and more recently Uyo (Ijezie et al. 2015), all in Nigeria. Ideally, all paediatric cases should be submitted for postmortem examination and an autopsy rate of at least 75% is necessary to achieve educational, quality control, and research goals (Peres et al. 2006) Although there is a global decline in autopsy rates, from as high as 30 to 100% (Scottish Programme for Clinical Effectiveness in Reproductive Health 2001, Adappa et al. 2007, Hoyert et al.2011, Khong et al.2015) to as low as below 20 percent between the 1960s and the early 21st century (Kumar et al.2000, Scottish Programme for Clinical Effectiveness in Reproductive Health 2001,World Health Organization 2005, Adappa et al. 2007, Turnbull et al. 2015), the in-patient autopsy rate obtained in this study can be described as virtually non-existent and a far cry from what is obtainable in the developed world. Opposing views exist in the literature about autopsy rates in developed countries (Kumar et al. 1998, Kumar et al. 2000, Buckner et al. 2006). Kumar and colleagues (2000) in their study in which they compared autopsy diagnoses with ante-mortem findings reported that of 487 neonatal deaths reported over the 10 year period they reviewed, autopsies were performed in 296 (61%) cases. They also reported a significant decline in autopsy rates between two successive 5-year periods from 71.2% (1984-1988) to 47.7% (1989-1993). The reason put forward for the decline in autopsy rate was increasing use of bedside technology. However in an earlier study (Kumar et al. 1998) to identify trends in paediatric autopsy rates in which they looked at all pediatric deaths between January 1, 1984, and December 31, 1993 they concluded that autopsy rates did not change significantly during the study period. Similarly Buckner et al (2006) in their study on paediatric oncology cases compared autopsy rates between two decades from (1982 to 1991 (decade 1) and 1992 to 2001 (decade 2)) and concluded that on the overall there was no significant change in the autopsy rates over the period. The reason(s) for the divergent views could lie in the differences in peadiatric populations looked at in these studies (Kumar et al. 1998, Kumar et al. 2000, Buckner et al. 2006). While Kumar et al (2000) studied neonates and found a decline in autopsy rates over time this was not the case when they looked at the entire paediatric population (Kumar et al.1998). Also, while Buckner and colleagues (2006) looked specifically at paediatric oncology cases; Kumar and colleagues (2000) looked at neonates alone. Additionally, the differences in their findings may depend on a number of factors at the hospitals where these studies were done and these include case mix, autopsy policies, and clinician/pathologist expertise. It may also depend on available diagnostic

modalities at their disposal over the period of study. Autopsy rates have been observed to be on a continuous decline in Nigeria, despite the insistence of some tertiary hospitals on autopsy on all deaths within 24 hours, and all suspicious deaths (Coroner's law). In Ibadan, autopsies following childhood mortality fell from 60% of cases in 1961 to 3.6% in 2003 (Akang et al. 1992, Ayoola et al. 2005, Oluwasola et al. 2007).

A number of reasons could be suggested for the continuing decline in the autopsy rate (Start et al. 1996, Rosenbaum et al. 2000, RCPAAWP. 2004, Ayoola et al. 2005, Ekanem et al, 2007). These reasons could be influenced by the prevailing socio-cultural circumstances such as taboo to mutilate a body and fear of use of body parts for ritual purposes. Other factors include complaints of time wastage before funeral; death certificate being already issued before informing the family about the need for autopsy; arrangements to transport the body may have been made and cannot be delayed (Mudenda et al. 2012). The study also revealed higher numbers of forensic autopsies compared to hospital. This is in keeping with a study by Hoyert (2011) in which forensic autopsies were found to be on the increase while hospital autopsies are on the decline. This is believed to be one of the reasons why there are divergent views about whether autopsy rates are generally on the decline or not. Despite the perceived decline in autopsy rates, the benefits of performing autopsies are still upheld and widely documented (Stamboully et al. 1993, McPhee et al. 1996, Castellanos et al. 1997, Kotabagi et al. 2005, Cardoso et al. 2006, Salamati et al. 2008) as it is instrumental in accurately establishing the cause and manner of death. It also allows confirmation, clarification and correction of ante-mortem diagnoses as well as the identification of new and re-emerging diseases. Autopsies therefore prove instrumental in both protecting the public health and improving the accuracy of vital statistics. (Lundberg et al. 1998, Harold 2017). Despite modern diagnostic techniques, autopsy continues to reveal valuable and unsuspected information (Stambouly et al. 1993, Castellanos et al. 1997, Cardoso et al. 2006, Salamati et al. 2008). Stambouly and colleagues (1993) in their study on the correlation between clinical diagnoses and autopsy findings in children who died in the pediatric intensive care unit (PICU) differ from Kumar et al (1998) as they found that in 10% of cases of autopsy revealed a major finding that, if known prior to death, would have altered clinical management and might have resulted in cure or prolonged survival. They also revealed that 18% of the autopsy cases revealed major findings that, if known prior to death, would not have altered management. Most studies still maintain that autopsies, particularly in the paediatric age group continues to provide clinically significant data and remains a valuable tool in modern paediatric practice (Stambouly et al. 1993, Castellanos et al. 1997, Cardoso et al. 2006, Salamati et al. 2008). In addition, (Castellanos et al. 1997) suggested that new strategies have to be designed to increase the rate of autopsies. Although the number of in-patient autopsies in this study was low, infectious disease accounted for over 30 % of the causes of death. This supports the profile of paediatric mortalities being more from infectious diseases in developing countries compared to developed countries where they have more of non-communicable diseases as the major cause of death. To stem the decline in paediatric autopsy rates, our suggestions include, insistence on implementation of the coroner's law in our health institutions, ensuring that healthcare workers have sessions with caregivers so that they can understand the reasons and benefits of doing autopsies. The histopathology laboratories must be fully equipped and adequately manned so as to ensure timely autopsies. On the other hand public enlightenment campaign must address parental concerns about autopsies and disabuse their minds about erroneous socio-cultural beliefs (Ijezie et al. 2015).

CONCLUSION

Paediatric autopsies are not routinely performed in our environment and new strategies are needed to increase autopsy rates.

Conflict of interest: Nil

ACKNOWLEDGMENT

We thank the Health Research Ethic Committee of ESUTH/Parklane Enugu for giving approval for the study. We thank the heads of the various units in the paediatrics and pathology department of ESUTH/Parklane, Enugu Nigeria for allowing us access to their records for data extraction.

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