

DETERMINANTS OF OUTCOME OF NEONATAL SURGICAL EMERGENCIES IN GOMBE: A 3-YEAR RETROSPECTIVE REVIEW

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ABSTRACT

Background: Mortality associated with neonatal surgical emergencies is high, due to late presentation and delayed surgical intervention in developing countries. The aim of this study is to determine factors associated with poor outcome of neonatal surgical emergencies at a Federal Teaching Hospital Northeastern Nigeria.

Methods: A retrospective study of 85 neonates aged 1-28 days was carried between June 2019-May 2022. Records of the neonates with surgical emergencies were retrieved and analyzed with the SPSS Version 20.

Results: A total of 85 neonates, 55 (64.8%) males and 30(35.3%) females were analyzed. The average duration of symptoms at presentation is about 5.3-day range 1-10days. About 51(60.0%) neonates presented after 24 hours of life 34(40.0%) within 24 hours of life, out of which were 12(35.3%) neonates with gastroschisis presenting after 8hours with severe hypothermia axillary temperature of 32.1° Celsius. The 46 (90.2%) neonates presenting after 24hours of life had travelled distances of 50-100Kms to get to the hospital, out of which about 31(67.4%) arriving the following day, with about 9(29.0%) who had gastroschisis noticed to be lifeless at presentation. Overall, about 26(30.6%) died due to late presentation, delayed surgical intervention and lack radiant warmers.

Conclusion: Late presentation delayed surgical intervention are common causes of mortality in neonates with surgical emergencies in Gombe

Keywords: Neonatal surgical emergencies, Late presentation, Delayed surgical intervention

INTRODUCTION

The last 60 years has witnessed a tremendous improvement in outcome of treatment of neonatal surgical emergencies in the developed world due to availability of specialist surgical care, early presentation and intervention, improved anaesthetic care and diagnostic facilities.¹ Unlike in developing countries where the outcome is still poor due to non-availability of resources and untrained man power.² The ability to provide timely and effective surgical care to newborns in these settings is crucial not only for immediate survival but also for long-term health and well-being. Even though progress have been made over the years in our region as in the study by Ekwunife *et al.*³, there seems to be more work to be done. The Federal Teaching Hospital, Gombe is the only tertiary healthcare in this region, saddled with the complex task of managing neonatal surgical cases. This underscores the importance of reviewing our experience with the management of neonatal surgical cases. Our aim therefore is to determine preoperative factors associated with poor outcome of treatment of neonatal surgical emergencies at Federal Teaching Hospital, Gombe in Northeastern Nigeria.

METHODS

Retrospective data of neonates aged 1-28days presenting to Federal Teaching Hospital, Gombe with surgical emergencies was analyzed between June 2019 and May 2020.

Data analyzed were distances travelled to reach the hospital by patients' address, duration of symptoms, reason for delay intervention, and outcome. Neonates with orthopaedic surgical emergencies were exclude from this review. Data were analyzed using simple descriptive analysis.

Study location

Federal Teaching Hospital Gombe is the only tertiary health facility in the state of a population of 2,398,957 people according to NBS⁴. Patients are received from all the 11 local government areas and the neighboring state villages. The Paediatric Surgery unit was established in 2011 and has a bed capacity for 30 spaces. All neonates come through the Special Baby Care unit irrespective of pathology before paediatric surgeons are called to review.

RESULTS

There were 96 neonates, but records of only 85 (88.5%) neonates, 55(64.8%) males and 30(35.3%) females, ratio of 1.9:1 M: F were available for analysis.

About 29(34.1%) neonates had anorectal malformations, 23(27.1%) gastroschisis, 17(20.0%) omphaloceles, 8(9.4%) Hirschsprung's diseases, 4(4.7%) intestinal atresias and 2(2.4%) intestinal malrotations 2(2.4%). Average duration of symptoms before presentation is about 5.3-days, range 1-10days. Mots (60.0%) neonates presented after 24 hours of life, the rest 34(40.0%) within 24 hours. In terms of distances travelled, 46(90.2%) had travelled distances of 50-100Kms to reach the hospital, with 31(67.4%) of them arriving a day after. Nine (29.0%) of them who had gastroschisis wrapped in dirty clothes already death at presentation.

Surgical intervention was delayed in 19(22.4%) by 8-72-hours partly due to delay in inviting paediatric surgeons, in getting investigation results, in getting blood, in buying intravenous fluids and antibiotics, in signing consent for surgery, to control sepsis, fluid and electrolyte deficits and acute renal failure. Seven (36.8%) neonates died for severe dehydrations and sepsis before they could be resuscitated for surgery.

Overall, 47 (55.3%) neonates were operated after 24hours of presentation and 22(25.9%) neonates within 24-hours of presentation, As shown on Table 1.

There was an overall mortality of 26(30.6%) due to sepsis, malnutrition and hypothermia. Out of this, about 10(38.5%) neonates died within 6-12 hours after surgery from hypothermia. Reasons for this early post

operative death was due to the fact that hypothermia were limited radiant warmer, non-functioning incubators and power failure.

DISCUSSION

This three-year retrospective review shows that neonatal surgical mortality is in Gombe Federal Teaching Hospital is accordance with other reports in Nigeria and other African countries. We had an overall mortality rate of 30.6%. The overall neonatal mortality rate of 30.6% observed in this report is accordance with other reports in Nigeria. Yola *et al.*⁶ had a mortality rate of 16.9 in Kano, Iniabasi *et al.*⁵ had mortality rate of 62.2% reported in Uyo Teaching Hospitals in Nigeria. Across Africa mortality rate of 24%, 43.1% have been associated with neonatal surgical emergencies in Kenya and Cameroun reports respectively.^{7,8,9}

Our study identified late presentation, delayed surgical intervention and limited or lack of facilities as determinants of poor outcome in neonates with surgical emergencies. Similar findings have been reported by others. Abubakar *et al.*¹⁰ reported mortality of rate of 33.3% associated with late presentation. As like our report who had mortality rate of 36.8%. While other reports had mortality rate of 60.7%-72.7% due to delayed surgical intervention, because the parents delayed consent due to financial reasons.^{11,12,13} Whereas delay in buying resuscitation items probably due to finance for delayed surgical intervention in this report. Other reasons for delayed surgical intervention were delay in inviting the surgical unit, in getting investigation results and blood as observed by others.¹⁴⁻¹⁶

Furthermore, we had mortality rate of 29.0% due to late presentation in neonates with gastroschisis presenting death after travelling long distances to reach

Table 1: Depicting intervention time and outcome

Interventions N (%)	Time of intervention	Outcome after surgical interventions
Surgical interventions within 24-hours of admission 22(25.9)		
Silo application for 12(54.5)	8 hours of admission	5 died of sepsis, hypothermia & malnutrition
Colostomy 5(22.7)	19 hours of admission	
Anoplasty 3(13.6)	13 hours of admission	
Closure of ruptured Omphalocele major in 2(9.1)	6 hours of admission	All died of hypothermia
Beyond 24hours of presentation 47 (55.3)		
Colostomy 27(57.4)	2-5 th day of admission	
Silo application 2(4.3)	2 nd day of admission	All died of sepsis and hypothermia
Debridement of septic omphalocele sac 13(27.7)	8-10 th day of admission	
Ileoileal anastomosis 3(6.4)	2-3days of admission	1 died of sepsis with acute renal failure
Ladd's procedure 2(4.3)	2 nd day of admission	

the hospital, which could be due to sepsis, hypothermia, hypotension or hypoglycaemia. Osifo *et al.*¹⁷ reported 65.5% mortality in neonatal surgical emergencies associated with delayed presentation of which 7.5% were in neonates too ill on arrival and died during resuscitation.

There was more mortality among patients with anterior abdominal wall defects, which could be attributed to hypothermia or hypotension. Table 1. More mortality was observed in patients with omphalocele probably due to underlying metabolic or cardiac anomalies that the study failed to identify.

We attribute late presentation in about 68.5% of our patients presenting beyond 24 hours due to lack of transport. Without efficient transport it would be difficult to make a journey of 50-100KM in a day. Other probable reasons for late presentation could be lack of funds, ignorance, and parents also attributed lack of a family relative proficient in communication to accompany them to the hospital. As observed in this report and others.¹⁸⁻²² It's a common belief among our patients that language barrier will make communication difficult and hence, spent valuable time on waiting for a family member proficient in communication skills to come along with them. Envisaging this barrier, the hospital has provided a community liaison person or a hospital interpreter that can greatly facilitate communication between parents and the doctor. And this has improved incidence of early hospital presentation of patients with a surgical emergency by about 40% according to some reports.²³⁻²⁵

Generally, the mortality rate of 30.6% can be reduced by improved investment in equipment in our setup. In this report due to lack of radiant warmers, incubators and incessant power outages about 38.5% of the neonates died of hypothermia within the first 12 hours of surgery, which is a wakeup call towards infrastructure development in the neonatal unit of the hospital.

CONCLUSION

The determinants of poor neonatal surgical emergencies in Gombe are late presentation, delayed surgical intervention and limited resources. Hence, management of a neonatal surgical emergency could be a serious challenge because such factors play a significant role. But with public education and government intervention programs in providing free ambulance transportation services and equipment much mortality can lead to a reduction in the management of our neonatal surgical emergencies.

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