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Retrospective study of neonatal intestinal obstruction in Calabar: Aetiology and outcome

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Abstract Neonatal intestinal obstruction is the most common surgical emergency in the newborn period. Prompt diagnosis and urgent management improve the chances of a favorable outcome. Aetiology and outcome may vary in different parts of the same country.

Objective: To evaluate the aetiology and factors associated with mortality in neonates presenting with intestinal obstruction in University of Calabar Teaching Hospital, Calabar, Nigeria.

Method: This was a retrospective study of clinical records of neonates presenting with features of intestinal obstruction over an eight year period. The biodata, diagnosis, management and outcome for the neonates were documented.

Result: Forty neonates; 26(65%) males and 14(35.5%) females were studied. Imperforate anus was seen in 40% of subjects while

Hirschsprung's disease and intestinal atresia each were seen in 10%. Aetiology could not be determined in about a fifth of the cases. Age less than one week at presentation was significantly associated with a poor outcome. No case had surgical intervention within twenty-four hours of presentation. The overall mortality was 30%, most of these 9 (75%) was due to anorectal malformations.

Conclusion: The management and outcome of neonatal intestinal obstruction in our setting is poor. There is urgent need to upgrade our neonatal intensive care services to improve outcome in affected neonates. More Paediatric surgeons are required to reduce the gross inadequacy of expert as this would improve on the surgical intervention time as reported in this study.

Key Words: Neonatal intestinal obstruction Hirschsprung's disease

Introduction

Neonatal intestinal obstruction is a surgical emergency that requires prompt diagnosis and management.^{1,2} The aetiology and outcome vary in different parts of the world and even within the same country.^{3,4} Obstruction can occur anywhere from esophagus to the anus. Usually but not always, there is failure of canalization to create the lumen. Mortality associated with intestinal obstruction ranges from 21-45% in the developing countries compared to less than 15% in Europe and the United States.⁶⁻⁸ This has been attributed to late presentation and paucity of experts in the developing countries.^{9,10} Oguntoyin et al⁹ studied intestinal obstruction in a tertiary institution among 130 children. Twenty-four of these were neonates. Seventy-five percent of these mortalities occurred in the neonatal period. In Benin, Osifo et al¹⁰ found anorectal anomaly in 28 (39.4%) among the seven-one neonates with neonatal intestinal obstruction.

In that study late presentation, presence of multiple anomalies, aspiration and perforation were the major contributors to mortality.¹⁰

The only study done so far on intestinal obstruction in children in Calabar¹¹ did not sufficiently address neonatal intestinal obstruction but focused mainly on intestinal obstruction in older children. This study was therefore designed to identify the causes, outcome and factors affecting prognosis of neonatal intestinal obstruction at the University of Calabar Teaching Hospital (UCTH), Nigeria.

Subjects and Methods

This was a retrospective study involving all neonates presenting in UCTH with a diagnosis of intestinal ob-

struction from January 2002 to December 2009. Each subject on presentation was stabilized as much as possible with intravenous fluids, antibiotics as deemed necessary and nursing care. Radiological studies with gastrograffin or barium and ultrasound studies could not be done in most cases. Those considered sufficiently stable received surgical intervention. Information extracted from the case notes included biodata, age at presentation, period between presentation and surgical intervention and outcome. Any associated abnormalities were also noted. Simple proportions and percentages were used to analyze the data. Fischer's exact test and likelihood ratio were used to determine the statistical significance of differences.

Results

During the study period, a total of 3,853 neonates were admitted into the Newborn Unit. Out of these 40 (1.03%) presented with clinical features in keeping with intestinal obstruction. The male to female ratio among the neonates who presented with neonatal intestinal obstruction was 1.8:1 ($\chi^2 = 0.225$, $p = 0.894$).

Table 1 shows the causes of intestinal obstruction in study subjects. Imperforate anus followed by Hirschsprung's disease and intestinal atresia were the commonest causes. The aetiology could not be determined in nine (22.5%) of the neonates who either left against medical advice before appropriate investigation or died soon after admission. No autopsies were conducted due to non-consent approval from the parents.

Table 1: Aetiology of intestinal obstruction

Aetiology	Freq (%)		Test of Significance
	Yes	No	
Imperforate anus	16(40)	24(12)	Likelihood-ratio(χ^2)=20.45 df=5 p=0.001
Hirschsprung's disease	4(10)	36(18)	
Intestinal atresia	4(10)	36(18)	
Pyloric stenosis	3(7.5)	37(18.5)	
Indeterminate	9(22.5)	31(15.5)	
Associated abnormality	4(10)	36(18)	
Total	40(100)	200(100)	

The outcome variables studied were survival, left against medical advice (LAMA) and mortality. The overall mortality among the subjects studied was 30%, majority (75%) were due to anorectal malformations. A significant number LAMA before surgery (17.5%). Of the six that were operated upon, four (66.7%) died while two (33.3%) survived. (Table 2). Factor significantly associated with poor outcomes (LAMA and deaths), were presentation at age less than one week. A significant proportion 90.5% was discharged without surgical intervention.

Table 2: Factors associated with mortality

Age (week)	Outcome			Test of Significance
	Discharged	LAMA	Died	
<1	13	3	11	Likelihood ratio $\chi^2 = 6.092$ df=2 p=0.048
>1	8	4	1	
Total	21	7	12	
<i>Sex</i>				
Male	14	4	8	Likelihood ratio $\chi^2 = 0.225$ df=2 p=0.894
Female	7	3	4	
Total	21	7	12	
<i>Surgical intervention</i>				
Yes	2	0	4	Likelihood ratio $\chi^2 = 5.332$ df=2 p=0.070
No	19	7	8	
Total	21	7	12	
<i>Time lapse before surgical intervention</i>				
<24hours	0	0	0	
>24hours	2	0	4	

LAMA = Left against medical advice

Discussion

Neonatal intestinal obstruction has been reported as the commonest Paediatric surgical emergency². In this retrospective study over an eight year period neonatal intestinal obstruction occurred in 1.03% of cases seen in the Newborn Unit of the Paediatrics department in our hospital. This percentage is small compared to the number of neonates admitted with neonatal intestinal obstruction in Ife (24.3%) over an eleven year period. This wide disparity could largely be from the fact that the University of Calabar Teaching Hospital that is meant to be a referral center also attends to primary and secondary health care cases. There were more males in this study than females, though the difference did not reach statistical significance. Similar pattern has been reported by other authors^{1,2,8,10}. The greater premium placed on male babies in most African societies may partly explain this.

Imperforate anus 16 (40%) was found to be the commonest cause of neonatal intestinal obstruction in our center. This is in keeping with previous studies in other parts of the country.^{2,8,10} Early age at presentation was significantly associated with mortality. This could be attributed to severe forms of intestinal obstruction as well as early onset of neonatal mortality that are associated with poor neonatal outcomes. A similar trend was found by Ademuyiwa et al,⁸ in Ife. High forms of intestinal obstruction usually present with early clinical signs.

Nineteen neonates were discharged without surgical intervention among including nine who had indeterminate diagnosis. These could have been cases of high intestinal obstructions that were not determined due to the lack of facilities for prompt diagnosis as well as non-mechanical obstructions.

Mortality was high (30%) in those studied. This same trend has been found in earlier studies.^{8,10} Only six neonates 15% had surgical intervention out of whom four (66.7%) died. Poor outcome in our country has been attributed to the poor neonatal intensive care

settings for stabilization, lack of facilities to make prompt diagnosis and late presentation.¹⁰ The paucity of experts, limited functioning incubators with epileptic power supply may have been major contributory factors to these poor outcomes.

It is important to note that no child was operated upon within 24 hours of presentation for reasons including delays in investigations, unstable clinical state and unpreparedness of the theatre. This situation is unacceptable. It is expected that the hospital management should take urgent steps to correct these anomalies.

Paediatric surgical staff strength needs to be rapidly strengthened. The surgical response time must rapidly improve.

Conflict of interest: None

Funding: None

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Conclusion

The outcome of neonatal intestinal obstruction in our center is poor. In order to improve this outcome, there is need to rapidly improve our neonatal care facilities.

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