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Pattern of Neonatal Surgical Presentation and Outcome in Sinnar Hospital (2013-2014)

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Results: 145 neonates were managed. Out of them, 83 were males (57.2%), 61 (42.1%) were females while one neonate was intersex (0.7%%). The majority of cases are congenital in nature. Gastro-intestinal tracts diagnoses constitutes more than third of cases with.anorectal malformations predomining all diagnoses.

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Results: 145 neonates were managed. Out of them, 83 were males (57.2%), 61 (42.1%) were females while one neonate was intersex (0.7%). The majority of cases are congenital in nature. Gastro-intestinal tracts diagnoses constitutes more than third of cases with anorectal malformations predomining all diagnoses. 114 patients (78.6%) underwent surgical treatment, while 19 (13.1%) patients were managed conservatively. 57.2% completed their treatment successfully 19 (13.1) were ongoing management at the time of data collection. Eighteen died amounting for 12.4% hospital mortality. There was significant correlation between the diagnosis, including gastrointestinal diagnosis and outcome ($P < 0.001$) as well as for the type of surgical procedures and outcome ($p < 0.001$) also relationship is significant between outcome and duration of illness in the study population.

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I. INTRODUCTION

The neonatal population, constitutes a considerable proportion of admissions to the surgical wards and this puts a burden on the surgical units and health facilities^[1] of the 20 countries with the highest neonatal mortality rates, 80 percent are in Sub-Saharan Africa^[2]. The leading causes are congenital anomalies, surgical infections, and trauma^[3] 7% of deaths were related to congenital abnormalities^[4]. About half of all congenital malformations are surgical, an obvious method of decreasing the burden of childhood disease is the prevention and early treatment of neonatal surgical conditions, many of which result in disability or death when left untreated.^[5]

II. PATIENTS AND METHODS

This is a descriptive, cross-sectional hospital-based study conducted at Sinnar Teaching Hospital. A

preformed questionnaire is structured to elicit relevant personal and demographic data of the neonates, then the presenting problem and the associated abnormalities with the full clinical assessment which was performed. The pathology and type of management with the outcome were clearly documented. The last item is followed more in the out-patients clinic. On 2012 the total number of registered deliveries in Sinnar State was 25.305 (Sudan Federal Ministry of Health statistics). The only and the single university-based teaching hospital in Sinnar state caring for this huge number is Sinnar Hospital where the the pediatric surgery unit is part of the surgical department (90 beds), it was established on 2009, it consists of one pediatric surgeon, one or two surgical registrars, two medical officers and eight to ten house officers, it accepts all children from day one to the adolescence with the minimum facilities so the number presented face the limited resources. neo-borns with surgical problems are managed in the general surgical ward which minimally equipped to receive adult as well as and neonatal patients. The working personnel in the theatre & wards are not trained to professionally managing neonates so operations are achieved by technicians. Neonatal surgical cases were initially handled by the general pediatrician in ER where some sort of emergency resuscitation are afforded for the needing neonates. After that referral for the surgical unit is selective for only cases likely to be managed there, otherwise direct referral to more specialized centre out of the state is preferred. Evaluation of neonates was largely clinical, supported by simple laboratory tests and plain X-ray. This situation made the unit to limit surgical intervention to only those in special need for urgent intervention; others are preferred to be operated beyond neonatal life.

III. RESULTS

A total of 145 neonates were managed. Out of them, 83 were males (57.2%), 61 (42.1%) were females while one neonate was intersex (0.7%). most of the study population came from different areas out of the reach of Sinnar. Therefore, 60% (n=87) of the study population needed more than hour transportation time to reach) however, transportation time is not significantly associated. The majority 90.3% (n=112) of the cases were having congenital diagnoses whereas Gastro-intestinal tracts diagnoses constitutes more than 37% (n=54) of cases, other cases are abdominal wall

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defects, neural tube defects, umbilical granulomas, haemangiomas and vascular malformations, musculoskeletal malformations, genitourinary diagnoses and other various clinical conditions. Anorectal malformations predominated the G.I T diagnoses. 114 patients (78.6%) underwent surgical treatment, while 19 (13.1%) patients were managed conservatively. A total of 83 (57.2%) were successfully managed in the hospital, 19

(13.1%) were still on management at the time of data collection. Eighteen died amounting for 12.4% hospital mortality. There was significant correlation between the diagnosis, including gastrointestinal diagnosis and outcome ($P < 0.001$) as well as for the type of surgical procedures and outcome ($p < 0.001$) also relationship is significant between outcome and duration of illness in the study population.

Table 1 : Frequency distribution of the clinical Diagnoses of the studied neonates

Clinical diagnoses	Frequency	Percentage
Gasrointestinal diagnosis	54	37.24%
Umbilical granuloma	19	13.10%
Abdominal wall defect	16	11.03%
Neural tube defect	12	8.27%
Vascular malformation and haemangioma	10	6.90%
Musculoskeletal	10	6.90%
Genito-urinary	8	5.51%
Septic	11	7.59%
Other	5	3.46%
Total	145	100.0

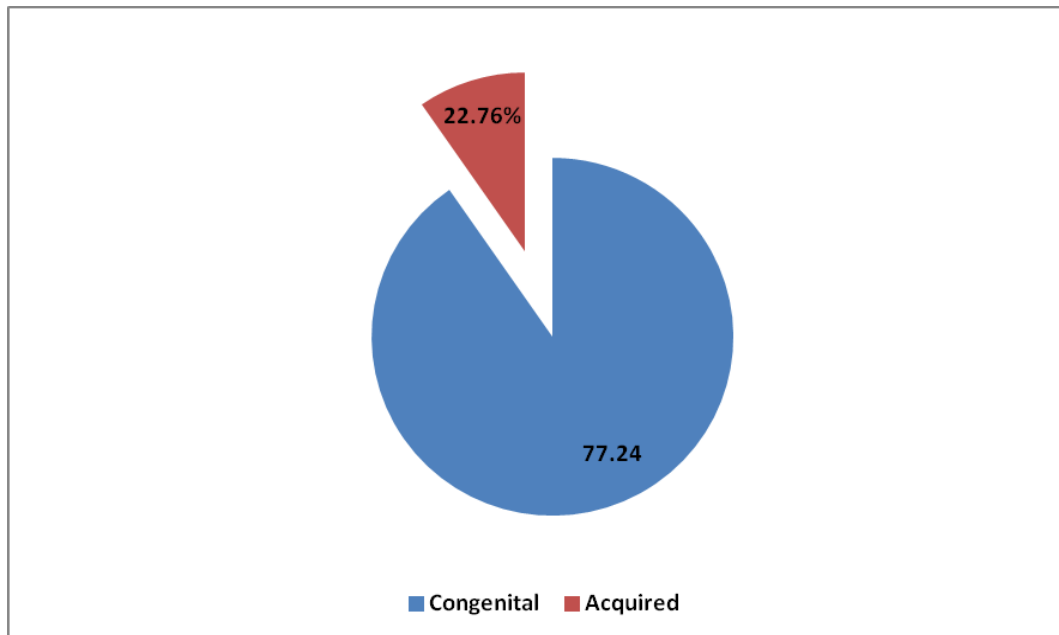


Figure 1 : Congenital versus acquired diagnoses

IV. DISCUSSION

In this study 145 neonates admitted with different surgical conditions to Sinnar Teaching Hospital Surgical Unit were enrolled. This may not reflect the true number because some cases may be referred directly to higher centers due to the sorting system of the hospital as mentioned earlier. 83 were males and 61 were females, and there was one intersex. Males predominance was also reported by Ahmed^[6] and Ademuyiwa^[7]. Our male to female ratio of 1.36:1 is close

to Ugwu result^[8]. The mean age of infants in this study was 11.61 ± 8.81 days which is comparable to Ahmed^[6]. This age is far more than that reported by Ugwu O ($120.29 \text{ hours} \pm 146.47 \text{ hours}$). This young age of presentation in their study might be attributed to the fact that their study was conducted in a tertiary hospital where most of the deliveries were in the hospital whereas our sample was mixed from within and outside deliveries.

Regarding transportation time and its effect on outcome, P value was 0.912, i.e. insignificant. In contrast

to an Indian study which proved that Prolonged neonatal transport (> 1hour) was found to increase the mortality among transported neonates.^[9]

In this study, the vast majority of the neonatal surgical conditions were congenital mounting for 77.24%. This figure is very high compared to Mhando in a study from Tanzania^[10] who reported a rate of 26% but less than the 88.7% reported by Ugwu^[8]this predominance of congenital diagnoses upon other ones may explain the male predominance. An Egeptian study^[49] proved this.It hypothesised the occurrence of these abnormalities to be genetics, environmental, multifactorial such as Consanguineous marriage (which is common in other Arab countries.^[50]

Maternal age, Increasing paternal age above 50 years receival or not of antenatal care with supplementation with folic acid or multivitamin, Multiparity, Maternal obesity, lower socio-economic groups^[11]so this needs more sophisticated research in our locality to elicit similar risk factors is only for more efficient measures will be developed to prevent these severe costly and often deadly defects.

A little less than half of neonatal surgical conditions in this study were mainly abdominal. This is less than the figure reported by Ameh et al at a referral hospital in Zaria, Nigeria ^[13]. The retrospective nature of their study might overestimate abdominal conditions because their records are likely to be adequate rather than for other conditions. However the setting and the condition of transportation and home delivery were the same as for this study. Rate of gastrointestinal diagnoses in this study is similar to Ugwu et al results (43.7%)^[8] but much lower than that reported by Sowande et al ^[14](82%). However, Sowande and colleague work was mainly concerning emergency neonatal surgical condition compared to our population which included elective cases as well, a factor raising their figure because most of the emergencies are likely to be abdominal as well as well as congenital gastrointestinal lesions. In a hospital based retrospective review of major congenital malformations in 353 newborns delivered at the Lagos University Teaching Hospital during a 10-year period(1981-1990), revealed also that gastrointestinal malformations were the commonest followed by central nervous system.^[15]

In this study the common gastro-intestinal conditions were anorectal malformations, malrotation, atresia, Hirschsprung disease, congenital hypertrophic pyloric stenosis, necrotising enterocolitis and meconium ileus. Most of the gastrointestinal conditions usually present as emergencies as intestinal obstruction. This is similar to that reported by Ahmed where he reported anorectal conditions as a third of those presenting to Khartoum Teaching Hospital with intestinal obstruction during the neonatal period^[6]. The high rate of anorectal conditions might be explained by their easy diagnosis relative to the other gastrointestinal

conditions. It is well noticed That many systems are not encountered in the study, for example head and neck cases, thoracic cases, cardiopulmonary cases as well as other commonly diagnoses mentioned in similar studies including neonatal population, this may be due to sorting system mentioned or may be due to fragility of those neonates leading to their loss before arrival at hospital.

In this study more than half of infants with surgical conditions were successfully managed i.e. conservative with or without surgery or referred to a higher centre while a minority were managed with morbidity. Despite lack of basics in our setting, our rate of success of treatment is comparable to to Ugwu et. al. results ^[8] however their study was conducted in a tertiary hospital. Mixed type of deliveries, home or hospital may not reflect the true outcome and the comparable results might be coincidental. Lack of antenatal care among other factors might probably adversely affect the outcome in this study.

The overall mortality of neonates with surgical conditions in this study was 12.4%, a much lower figure than Ugwu *et. al.*^[8] Other authors had even higher mortalities ranging from 30% to more than 42%^[13,16,17] The small sample and the rural nature of the hospital, which lacked a neonatal intensive care unit, might render admission of difficult cases and hence relative reduction of endangered cases. This was clearly illustrated in this study as a high mortality among infants who underwent staged surgery and repair. The nature of management of neonatal surgical condition offered at Sinnar Hospital was a favourable factor associated with better outcome in this study. Delay in presentation shortage of personnel and inadequate facilities as being the major problems associated with management of neonatal surgical patients were identified in other studies^[13,16,18]. Most deaths are justified by sepsis, respiratory causes, anaesthetic causes electrolytes imbalance, meningitis and associated cardiac disease. But because of delayed presentations and since deficiencies of monitoring and support facilities, incubators, NICU, trained available staff, plus scarcity of laboratory blood cultures and arterial blood gases measurements; mortalities can said to be multi-factorial of dehydration, infections, hypothermia and all above factors. There were significant correlation between diagnoses, duration of illness, type of surgery and outcome. Regarding transportation time effect on outcome, P. value is 0.912, i.e insignificant, in contrast to an Indian study which proved that Prolonged neonatal transport (> 1 hour) was found to increase the mortality among transported neonates^[19]

This study, however, has its own limitations. The small sample is a limiting factor. The state of antenatal care and the gestational age were not studied as possible confounders in this study and as for all hospital

studies results may not be generalized for the whole population thus further wide-scale surveys are needed.

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Photographs tell the story of successful surgery performed on the conjoint twin during the study.



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