Prematurity in Central Hospital and GN Children's Clinic in Warri Niger Delta.

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SUMMARY

Aim: To determine the pattern of presentation of prematurity in Warri Niger Delta.

Materials and Method: Retrieval and analysis of casenotes of all the premature babies seen between 2000 and 2007 at General Hospital Warri, a specialist hospital with referrals from surrounding General Hospitals, and GN Children's Clinic, the two major hospitals for children for Warri and its environs.

Results: Of the 639 babies seen, 249 were males and 390 females, giving a ration of 1:1.6. The youngest in gestational age was 20weeks and five days while the oldest was 36weeks. The lightest in weight was 600g while the heaviest was 2,400g. Kangaroo nursing was introduced very early in the management. The weight on discharge ranged from 1200g to 2400g, with very good result. The average weight on discharge was 1500g. The overall mortality was 25.3%, but was 85.5% in those less than 28weeks of gestation. Mortality was also higher in males at 38.6% to 16.9% for females. Respiratory complications are the commonest cause of death, accounting for 30.8% of the death rate.

Conclusion: Prematurity remains a major cause of morbidity and mortality in the newborn period in developing countries. Early maternal handling and introduction of cup and spoon feeding will reduce the time of hospital stay and also the cost of management.

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INTRODUCTION

Prematurity is a major contributing factor to the high neonatal mortality in developing countries[1,2]. Some of the factos that influence the success in the management of prematurity include gestational age, sex, the level of prenatal care, the availability of resources, and adequate and well trained personnel.[3] Notable figures that were born preterm include Sir Isaac Newton whose mother described him as small enough to fit into a quart mug and Sir Winston Churchill was also born as a *preemie*[4].

Many premature babies do not reach the hospital on time in developing countries as a result of poverty and poor infrastructural development, so that by the time the babies arrive at centers for specialized care, infections and other problems of prematurity have already set in. Moreover, there are few newborn special care facilities in the country which are not only understaffed, but also not fully equipped. These facilities are often so over stretched that the facilities may device improvised means of managing these babies. Over whelmed by the number of deaths due to prematurity, the Kenyatta National Hospital in Kenya had to send a nursing sister to learn and later implemented the Kangaroo nursing she learnt in Bogotá Columbia and at that hospital, health personnel do the Kangaroo nursing[5].

The Central Hospital Warri and GN Children's clinic, a private clinic in Warri where thise review was carried out serve about three local Government areas in Delta State of Nigeria with a combined population of two million three hundred and fifty, using the 2006 Nigerian census figure[6]. The review was for a period of eight years from January 2000 to December 2007. Six hundred and thirty nine (639) preterm babies were managed within this period in these hospitals and the outcome will be discussed. These will include the pattern of presentation, the challenges encountered and the death rates.

MATERIALS AND METHOD

The case notes of all the preterms managed in Central Hospital and GN Children's and General Medical Clinic Warri, from January 2000 to December 2007 were colleced and analyzed. Information obtained were the gestitional age at birth (both from last menstrual period of the mother, the antenatal ultrasonographic report of the mother and the clinical estimation at presentation), weight at birth, sex and age at presentation, prenatal events (i.e. antenatal history of the mother for that particulat pregnancy), mode of delivery, and the occupation of parents. Other information obtained include any complicating illness and management instituted for ech preterm, duration of stay at the hospital of each preterm, outcome (survival, complications or death), weight on discharge and follow up records.

On admission, each child was weighed and gestational age assessed using the Dubowitz[7] and Ballard method[8]. The following investigations, as baselin for all babies, were carried out: Full blood count, blood group, serum bilirubin, serum urea, Electrolytes and creatinine, serum calcium and blood glucose. These who need incubator nursing were put in the incubators, keeping the termperature between 36.5°C and 37.2°C. Each was

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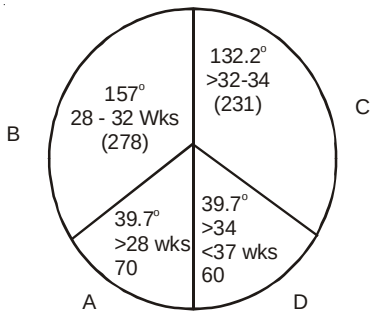
started on 8–10% dextrose at 70ml/kg on day one and increased by 10ml/kg/day upto 100–150ml/kg depending on the fluid requirement of each child. Because of the high possibility of infections even before arrival, they were started on intravenous ceftazindine 30–50mg/kg and gentamycin 3–5mg/kg. The treatment was discontinued after 96hours if there is no sepsis. Feeding was generally started on the 3rd day with 5% dextrose which changed to expressed breast milk or Pre-Nan milk manufactured by Nestle if breast milk is not available for whatever reason. The amount is 1-5ml given every two hours and gradually increased depending on the caloric requirement and tolerance of each child. If the babies do not tolerate the feed and infection or ill health ruled out as cause of poor tolerance, erythromycin 5mg/kg per dose four times in a day was given to the child orally until the child starts tolerating better9,10. As the amount of oral feeds increased, the amount of fluid given intravenously was reduced. Each child was put on phototherapy prophylactically in anticipation of jaundice of prematurity. Vitamin K was given intramusclarly as a rountine for newborn babies to prevent hemorrhagic disease of the new born[11]. Aminophylline at the dose of 4–6mg/kg per dose was given those 34weeks and below, because theophylline has been found to stimulate the respiratory center of pretrems[12]. They were also given dexamethazone prophlactically, to improve lugn maturity especially in babies less than 32wks[13]. Each child ois given folic acid and multivatmin orally which are important cofactors in nucleic acid formation, especially for the growing child. They were weighed on alternate days until they are discharged. The time of discharge was when the baby weighs 1.5kg or at least has regained the birth weight.

RESULTS

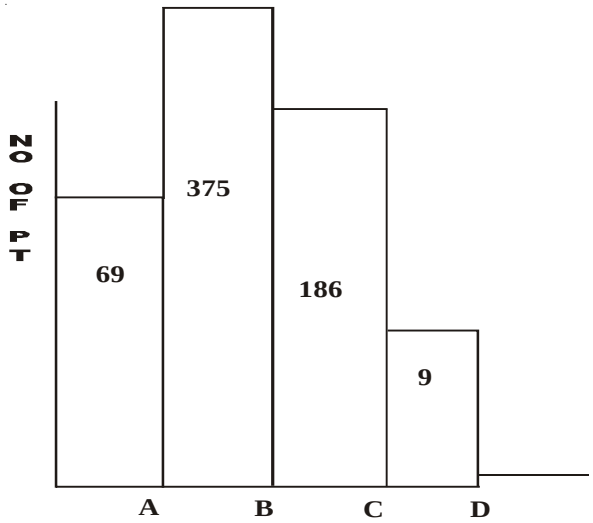
The youngest in gestational age at presentation was twenty weeks five days (20wks, 5/7) and the lightest in weight was 600grammes (.6kilograms). The oldest gestational age was thirty six weeks (36wks) and the heaviest in weight was 2.4kilogrammes. Two of the youngest at 24wks and six days, and 27wks weighing 650grammes and 700grammes respectively are both alive.

Most of the patient weighed between 1.0kilogram and 1.5kilograms and gestational age between thirty and thirty four weeks. Fig 1 is a pie chart representing the distribution of the babies according to their gestational age.



A - less than 28 weeks, B - 28 – 32 weeks
C - more than 32 – 34 weeks, D - more than 34 but less than 37 weeks

Fig. 1: A pie chart showing the distribution of the babies according to ehir gestational age



A - Less than 1kg
B - 1–1.5kg
C - Greater than 1.5kg
To less than 2.5kg
D - Above 2.5kg

More females than males were seen (M:F=249:390), giving a ratio of approxiately 1:1.5. The average weight on discharge was 1.5kilograms. However as a rule, the babies were discharged after regaining their birth weight. There was no mortality recorded from discharging the babies at weight even as low as 1.2kg. These babie were discharged at these low weights because of parental requst due to lack of funds as the cost of managing the preterm babies is enormous.

One hundred and sixty two (162) of the six hundred and thirty nine (639) babies seen died representing a mortality rate of 25.3%. Mortality rate according to the gestational ages show that the highest death rate occured at the age less than twenty eight weeks with a case fatality of 85.5% (Table 1). Though more females were seen, mortality was more males, as ninety six males compared to sixty six female died (96 males: 66 females: $x^2 = 37.4$, $p = 0.00$). Overall mortality for males is 38.6%, compared to 16.9% for females, table 2 shows the causes of death.

This shows that respiratory problems were the major causes of mortality mainly apnea and failure to sustain respiration. This is followed by infections and asphyxia. The death in about 11.1% of the babies could not be explained. Neonatal jaundiceand anaemia were other causes of death. Five of the babies died from aspiration after feeding.

Table 1: showing the number of Deaths and the Case Fatality Rate according to Gestational ages

Gestational age	Number of Deaths	Total No of Pat	Case Fatality Rate
Less than 28wks	60	70	85.7%
28-32wks	56	278	20.1%
>32wks to less than 34wks	44	231	19%
>34wks & <37wks	2	60	3.3%

Table 2: showing the causes of Death and % of the Overall mortality

Causes of Death	Number of Patients that died	% of the Total that died
Respiratory complications	60	36.4%
Infections	30	18.5%
Asphyxia	25	15.4%
Neonatal Jaundice	15	9.2%
Anaemia	10	6.2%
Aspiration	4	2.5%
Unexplained	18	11.1%

DISCUSSION

Most of the babies studied fell were delivered between the gestational ages of twenty eight weeks to thirty four weeks i.e. 509 out of 639 (79.7%). Majority of the smaller babies die before they reach the hospitals and most of those less than twenty weeks of gestation do not survive. Infact some of them present already dead. The number of females were above 1.6 times more than the males. This is surprising. It could be because of the death of the males before presentation, as some of the babies were brought in even one week after birth.

Some of the babies were discharged even at 1.2kg on the insistence of the parents as a result of poor financial power and they are still alive. The average discharge weight was 1.5kg. The mothers were thought how to feed the children using cup and spoon and also Kangoro nursing which was found to be very effective[14]. This was particularly helpful especially with poor power supply and recurrent fuel scarcity to even run the generators. The babies were weekly reviewed to assess the weight gain or any problem that may arise until they weighed 2.5kg each. There was no death recorded as a result of this seemingly premature discharge.

The commenst complications encountered were respiratory abnormalities, namely respiratory distress and recurrent apnea. These accounted for 36.4% of the overall mortality. This is in keeping with the experience in other centers[15,16]. Infections and asphyxia were the other complications. Even as infection was the second commonest cause of the deaths, the most common infection was pneumonia particularly in the immature babies, a similar experience by Barton and colleagues16. This further complicates the respiratory abnormalities in them. The overall mortality was 25.4% which was higher than that by Newman et al.,[17] b ut lower than that record in Teheran[18]. Mortality was very high in those less than 28wks. Infact, Kuti and Owa put the average age of viability at 28wks.[15] As shown in the results, more males than females died (96:66). It is a general observation that male preterms fair poorer than females at each gestational age and weight[19]. Part of the reason given for this is that the production of immunoglobulin is X-linked, and so the females have double dose which gives them stronger resistance against infections. The female to male mortality ratio was 2.3:1. This is a very high ratio, but this was what was observed from the study. A prospective study is being undertaken to review all the strange findings. Mortality was highest in the immature or extremely low birth weight babies as is the experience in other places.[19]

Respiratory problems and infections accounted for deaths of most of the baibes and part of the reason for the infections is that most of tehm were born outside these specialized centers. Some were delivered at home in very unsterile environment. The death of a significant numbe rof our patients could not be explained or linked to the aforementioned causes. Autopsy was not done on the deceased largely because of parental objections. The reasons given were mainly religious and traditional beliefs.

CONCLUSION

Prematurity remains a major cause of morbidity and mortality in developing countries. Financial constrains make parents not to seek medical attention early enough as some of patients present even one week after delivery and for the same reasons, they usually demand for discharge prematurely. It is not cheep to manage prematurity. The economic burden is so much as documented by Tonga and colleagues. They found tha the expenditure ranged from US$211 to US$1539, which constituted about 22.8% to 39.66% of the combined family income of the patients.[20] Our experience has shown that once the babies are making good and steady progress they can be discharged with weights about 1.5kg, but with very close follow up dates. Mothers were allowed to handle the babies early in the management of these babies provided there are no medical contraindications. Early introduction of feeding with cup and spoon facilitates this handling which also improves maternal bonding while at the same time reducing the cost of managing these premature babies as a result of early discharge.

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REFERENCES

1. Ezechukwu C. C. Ugochukwu E. F., Egbuonu I., Chukwuka J. O. Risk Factors for Neonatal Mortality in a Regional Tertiary Hospital in Nigeria. *Nigerian Journal of Clinical Practice*. 2004; **7:** 50–52.
2. Fetuga B., Ogunlesi T., Adekanmbi F., Olanrewaju D., Olowu A. Comparative Analyses of childhood deaths in Sagamu Nigeria; Implications for the fourth MDG. *SAJCH* 2007; **1:** 106–111.
3. Baron L., Hodgaman J. E., Pavlova Z. Causes of death in the extremely low birth weight infant. *Peadiatrics* 1999; **103(2):** 446–451.
4. Brandel E. sited on 12/07/09 at http:/en.wikpedia.org/wiki/preterm_birth.
5. Nguigi W. E. The Standard of Kenya. Sited on 12/07.09 at: http:/www.easterndard.net/InsidePage.php?id=1144007581&cid=4.
6. Federal Republic of Nigeria Official Gazette. 2007; vol 94(4) Page B47–53.
7. Dubowitz L. M., Dubowitz V., Goldberg C. Clinical assessment of gestational age in the newborn infant. *Peadiatrics*, 1970; **77:** 1–10.
8. Ballard J., Khoury J. C., Wedig K. *et al*. New Ballard Score, Expanded to include extremely premature infants. *J Peditr.* 1991; **119(3):** 417–423.

9. Gal P., Reed M. D. **Medications**: In Behrman R. E., Kilegman R. M. and Jenson H. B. Eds: In Nelson textobook of Pediatrics 17th editionSouth Asia Edition. Saunders publishers: 2489.
10. Aly H., Abdel-Hady H., Khashada M. and El-Badry N. Erygthromycin and feeding intolerance in premature infants; A controlled randomized trial; *Journal of Perinatology*, 2007; **27:** 39–43.
11. American Academy of Pediatrics. Committee of nutrition. Vit K compounds and water soluble analogues in therapy and prophylaxis. *Pediatrics* 1961; **28:** 501–506.
12. Scanlon J. E. M., Chin K. C., Morgan M., Durban G. M., Hale K. A., Brown S. S. Caffeine or Theophylline for neonatal apnea? *Arch Diseases of Childhood*. 1992; **67:** 425–428.
13. Lugo R. A. Eur J Clin Pharmacology. Pharmacokinetics of dexamethaxone in pretern newborn infants. *Eur J Pharmacol*. 1996; **49:** 477–483.
14. Witt C. L., Kangaroo nursing. Advances in neonatal care. 2008; **8(3):** 2.
15. Kuti O., Owa J. A. Gestitional age specific neonatal mortality among preterm singletons in a Nigerian tertiary institution. *International Journal of Gynecology and Obstetrics*, 2003; **8:** 319–320.
16. Barton L., Hodgman J. E., Pavlova Z. Cause of death in extremely low birth weight infant. *Pediatrics* 1999; **103:** 446–451.
17. Keller C. A., Nugnet R. P. Seasonal pattern f in perinatal mortality and preterm delivery. *American Journal of Epidemilogy*, 19983; **118:** 689–698.
18. Fallahian M., Mohammed K., Aghaie E., Ghandi A. Mortality rate of preterm neonates in two teaching hospitals in Tehern, Islamic republic of Iran. *Eastern Mediterranean Health Journal*, 1995; **1:** 2001–2004.
19. Furdon S., Clark D. A. Prematurity. e-Medicine sited on 12/07/09 at http://emedicine.com/article/975909-overview.
20. Tonga O. O. Orimadegim A. E., Ajayi S. O. and Akinyinka O. O. The Economic Burden of Preterm/Very Low birth weight infants in Nigeria; *Trop Pediatr* 2008; 2001–2004.