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Abstract

Background: Preterm birth is a global problem with the greatest burden experienced in sub-Saharan Africa and South Asia. In Kenya it is estimated that 12.3/100 live births are born preterm and prematurity is the leading cause of death in the first month of life, contributing to 35% of all neonatal mortality. In high income countries survival rate for preterm babies has increased due to offering care that is evidence based. However, in middle and low income countries the uptake of desired practices is low leading to poor outcomes. The aim of the study was to describe the care practices for preterm babies during the neonatal period in Kisii Teaching and Referral Hospital (KTRH).

Methods: A cross sectional descriptive study was conducted in the newborn unit of KTRH between April and May 2015. Fifty three preterm babies' parents and fifteen nurses were consented to participate in the study through census sampling method. Data was collected using a checklist. Data was analyzed using descriptive statistics.

Results: Thirty three (62%) preterm babies were born in the facility and 20(38%) were referred from other facilities. Only 11(20.8%) mothers of the 53 babies received antenatal steroids. Majority 41(78.8%) of the babies were resuscitated; 40(96.7%) were suctioned and 34(82.9%) received oxygen. The babies were kept warm soon after birth using radiant warmer 49(92.5%), skin-to-skin 3(5.6%) and 1(1.9%) was covered with a blanket and a cap. All preterm babies were treated with antibiotics prophylactically on admission and those who had RDS were put on CPAP. Majority 33(62.3%) of the preterm babies were nursed under the radiant warmer, while 20(37.7%) were nursed in the incubator and in 24(45.3%) kangaroo mother care was offered. Preterm babies were fed through the nasogastric tube initially and gradually fed by cup as the weight increased to 1.7kg and finally breast fed as the weight approached 2.0kg. Twenty seven

(50.9%) preterm babies were discharged based on weight gain 20(74.1%), ability to breast feed 27(100%), no morbidities 10(37.0%) and ability to control breathing 16(59.3%).

Recommendations: The facility is using evidence based practices though not adequately. This study recommends appropriate use of evidence based practice during care of preterm babies in order to have good preterm outcomes.

Key words: *Care practices, Neonatal period, preterm*

Introduction

Preterm babies account for almost half of all newborn deaths worldwide (Gravett, and Rubens, 2012; Howson et al., 2013). In Africa, prematurity is the leading cause of newborn death and contributes 29% of all the neonatal deaths (Blencowe et al., 2013). Prematurity is still leading cause of death in Kenya in the first month of life contributing to 34 % of all neonatal deaths (MOH, 2012). Many preterm babies die due to lack of simple but essential care such as warmth and feeding support (Lawn *et al.*, 2012).

In high income countries survival rate for preterm babies has increased due to offering care that is evidence based practice which include; use of corticosteroids during antenatal period for mothers at risk of preterm birth, use of CPAP, use of detailed quality of care protocols and job aids, promoting warmth, encouraging early breast feeding, ensuring cleanliness and offering resuscitation if required. Delay any of these measures to the preterm infant, can rapidly lead to deterioration and death (Lawns et al., 2012). National Perinatal Association, 2013 adds that monitoring temperature of the preterm baby on admission to the newborn unit and every 30 minutes until thermal, respiratory and cardiovascular stability is established is good practice. If the neonate unstable, first bath is delayed. Other evidence based practice include; delayed cord cutting, cord care with use of chlorohexidine (WHO, USAID, & MCHIP, 2013), kangaroo mother care (WHO, 2003), planned discharge (Jefferies, 2014), and follow up (AWHONN, 2013; Jefferies, 2014).

If evidence based care is not given, then pretem babies will have complications which include; respiratory distress syndrome, feeding difficulties, jaundice, Hypothermia, anemia, hypoglycemia, sepsis, hemolytic disease of the newborn, necrotizing enterocolitis and death.

The objective of the study was to describe the evidence based best practices used in Kisii Teaching and Referral Hospital.

Methods

The study was carried out in Kisii Teaching and Referral Hospital, which is a county referral hospital located in South Western Kenya (Oparanya, 2010). It is the largest government owned hospital in the county. It serves as referral hospital in South Western Kenya; covering South Nyanza, South Rift and the entire Gusii region (Akama *et al.*, 2012).

The population in this study was all preterm babies admitted into the newborn unit, between 28^{0/7} to 36^{6/7} gestational weeks. The study used a cross sectional descriptive design which describes the nursing care practices offered to preterm babies during the neonatal period in the newborn unit, in Kisii Teaching and Referral Hospital.

Census method was used whereby all 53 preterm babies born during the period of study were recruited into the study as they were admitted. The care given to the preterm was evaluated from the records (notes, cardex, partograph and nursing care plans) for a maximum of 28 days, from birth until discharge, transfer, referral or death and entered into the check list. Completed check list were coded and entered into the computer using statistical package for social sciences (SPSS) version 20. Data was summarized using descriptive statistics (frequencies, means and standard deviations). Chi-square test was used to check for significant relationship between categorized variables of interest (maternal age, antenatal steroids, and mode of delivery, birth weight, gender and gestational age) and death. Results were considered significant at $\alpha=0.05$ ($p<0.05$).

Ethical clearance was done by the Moi University, Institutional Research and Ethics Committee (IREC). Then permission was also sort from Kisii county research and ethics committee and Kisii Teaching and Referral Hospital Administration. The researcher further informed the unit manager of newborn unit and nurse in-charge of the newborn unit of the research and asked them to give permission. All participants were required to sign an informed consent which explained the purpose of the study, benefits and risks before commencing the study. Human right that required protection was put into consideration. This included right to privacy, right to anonymity and confidentiality, protection from discomfort and harm and right to fair treatment.

Findings

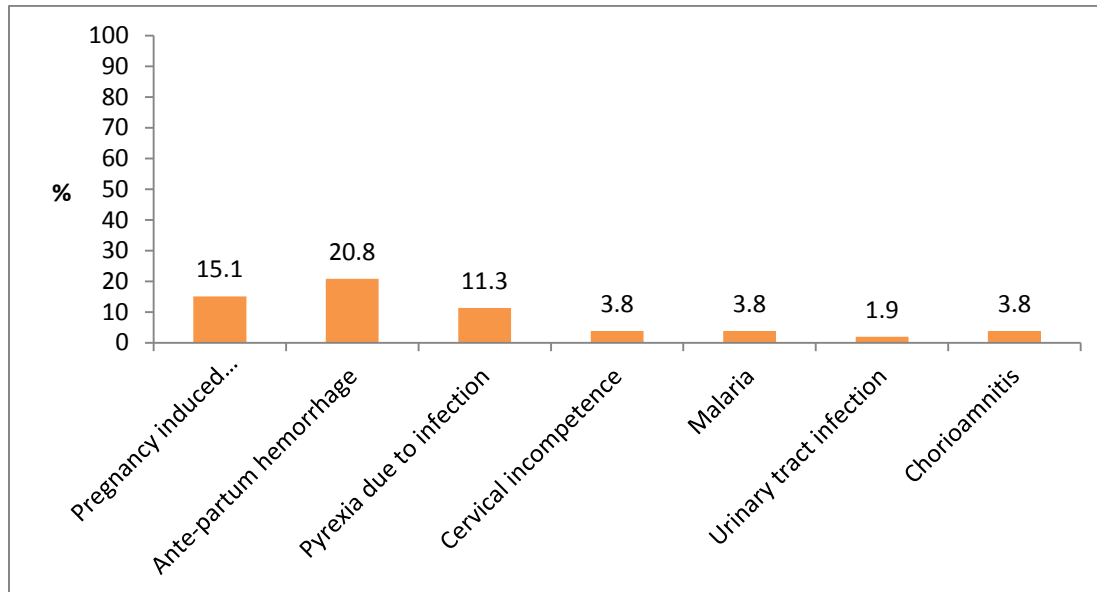
Fifty three mothers participated in the study and the following is their demographic characteristics. Slightly more than half of the mothers 27(50.9%) were aged below 25 years and 21(39.6%) had parity of between 2-3 children. Majority of the mothers 49(98%) were Rhesus positive. More than half 32(62.7%) had secondary level of education (see table 1).

Table 1: Maternal demographic characteristics

Characteristic	Frequency (%)
Age-group	
15-19	14(26.4)
20-24	13(24.5)
25-29	9(17)
30-34	11(20.8)
35-39	5(9.4)
40-44	1(1.9)
Parity	
1	19(35.8)
2-3	21(39.6)
4-5	12(22.6)
>5	1(1.9)
Education level	
Primary	14(27.5)
Secondary	32(62.7)
Middle level college	5(9.8)
Rhesus +ve	49(98)

Among the chronic illness, 6(11.5%) of the mothers of the preterm babies had HIV/AIDs. No other chronic illness was noted among the mothers of preterm babies. Regarding complications in the last pregnancy, 11(20.8%) had ante-partum haemorrhage, 8(15.1%) pregnancy induced hypertension, 6(11.3%) pyrexia due to infection, 2(3.8%) cervical incompetence, 2(3.8%) malaria, 1(1.9%) urinary tract infection and 2(3.8%) had chorioamnitis (see figure 1).

Fig 1: complications in the last pregnancy



Eleven (20.8%) of the mothers were treated with prenatal steroids during antenatal period. Twenty eight of the mothers (70%) had preterm pre-labour rupture of membrane while 12(30%) had artificial rupture of membranes. More than half 31(58.5%) had vaginal vertex delivery while 16(30.2%) had caesarean section and 6(11.3%) had breech delivery as indicated in figure 2 below. Majority of the preterm babies 49(92.5%) were kept warm immediately after delivery under the radiant warmer, 3(5.6%) put on the abdomen of the mother (skin to skin) while 1(1.9%) was covered with a blanket and cap.

Fifty three check list for the preterm baby were completed. More than half 32(60.4%) of the babies were female and 21(39.6%) were male. The mean Apgar score of the preterm babies was 6.4(Sd1.9) and 7.1(Sd1.9) at 1 minute and 5 minutes respectively. More than half 32(60.4%) had a birth-weight of between 1501-2500 grams (fig 3).

All preterm babies 53(100%) were admitted into the new-born Unit. Thirty three (62%) of them were born in Kisii Teaching and Referral Hospital (KTRH) while 20(38%) were referred from other facilities. Among them only 3(5.7%) were taken temperature on admission of which 1(2.2%) was admitted with temperature of 35.5°C while 2(4.4%) had a temperature of 36.2°C and 36.8°C.

Slightly more than half 30(56.6%) had gestational age of between 28 and 32 weeks while 23(43.4%) were between 32 and 36 weeks (see figure 4).

Majority of the babies 41(74.4%) had resuscitation done at birth of which 40(97.6%) were done suction and 34(82.9%) oxygen administration 15 (36.6. %) ambu bagging 2(4.9 %) chest compression (see figure 5)

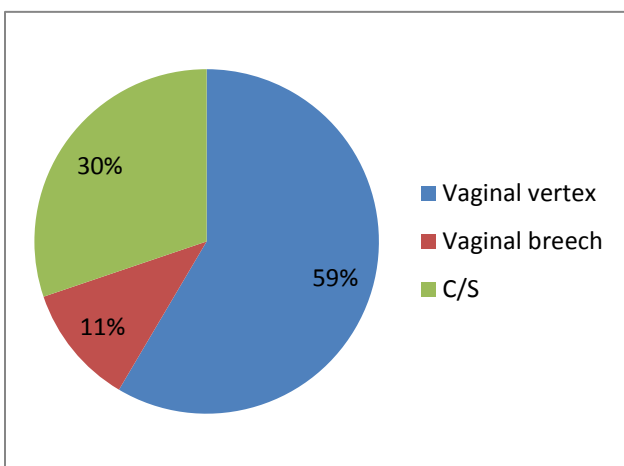


Fig 2: Mode of delivery

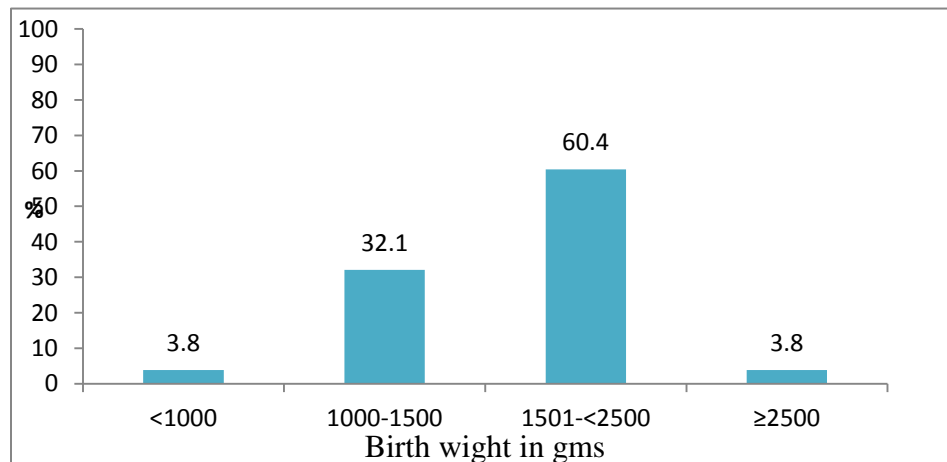


Fig 3: Birth weight of the preterm baby (gms)

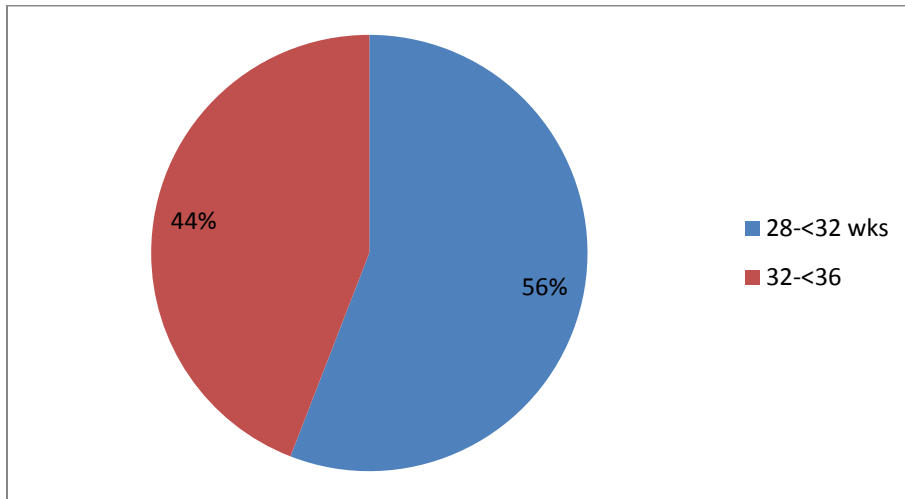


Fig 4: Gestational age

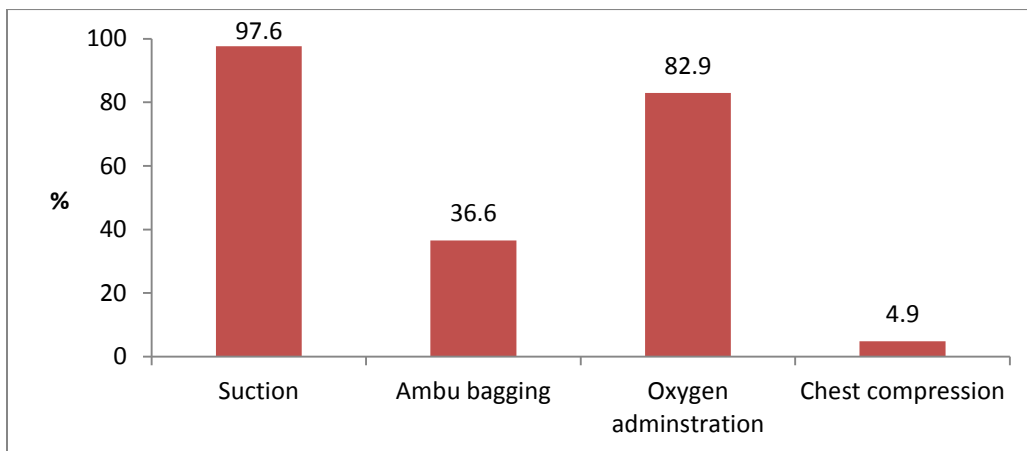


Fig 5: Resuscitation done at birth

Immediately on admission into the NBU 6(11.3%) were done for physical examination, 48(90.6%) were kept warm, 40(75.5%) were put on oxygen and 44(83%) were administered intravenous fluids as shown in figure 6. Preterm babies were kept warm by being nursed in the incubator 20(37.7%) and 33 (62.3) were put under radiant warmer. Kangaroo mother care was provided to 24(45.3%) of the preterm babies. Time of first bath was not indicated for majority of the babies 41(77.7%). Nine (17%) were given a bathed within 24 hours of birth while 3(5.6%) were bathed after 24 hours of birth.

More than a third 16(30.2%) of the preterm babies were initiated breast milk after 24 hours of birth, and a third 15(28.3%) were breast fed in the first 24 hours. Only 1(1.9%) was initiated breast milk within 1hour, 1 (1.9%) after 1 hour of birth, 12(22.6%) after 72 hours and 8(15.1%) were not specified when they were initiated breast milk as in figure 7.

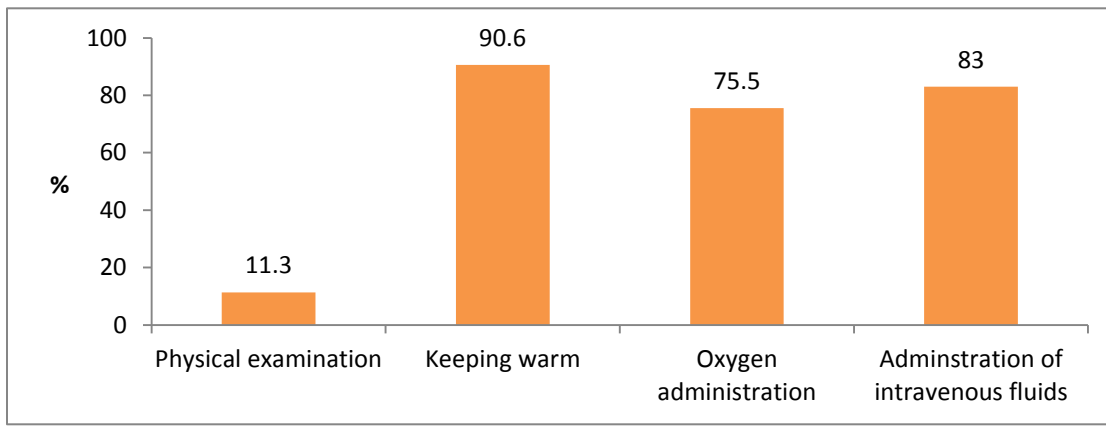


Fig 6: Activity done immediately on admission to NBU

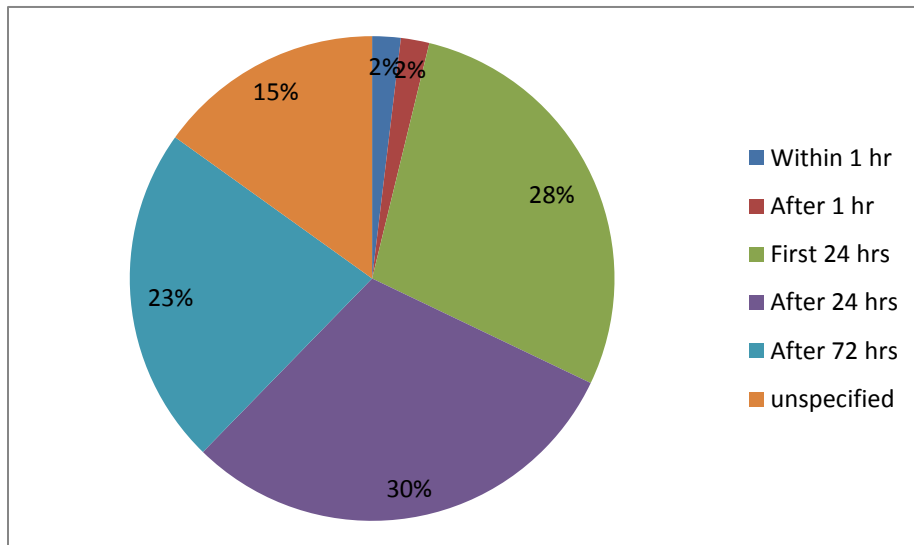


Fig 7: Initiation of breastfeeding

Twenty four (45.3%) were fed through the nasogastric tube with a mean weight of 1.6 kg, 18(40.0%) by cup with the mean weight of 1.7 and 23(43.4%) were breast fed with a mean weight of 1.9 kg as shown in table 2.

Table 2: Preterm feeding during hospital stay

Feeding type	Frequency (%)	Weight at the time of practice (mean)
Nasogastric tube	24(45.3)	1.6(sd0.3)
Cup and spoon	18(40.0)	1.7(sd0.2)
Breast feeding	23(43.4)	1.9(sd0.3)

There was no documentation on how cord care was done on all preterm babies during hospital. There was no documentation of relevant health messages shared to the parents of the preterm or the family.

Twenty seven (50.9%) of the pre-term babies admitted were discharged. Discharge was based on breastfeeding adequately 26(100%), 20(74.1%) sustained weight gain, 10(37.0%) on morbidities experienced by the preterm baby while 16(59.3%) based on ability to control the breathing with an apnea free period (see figure 8).

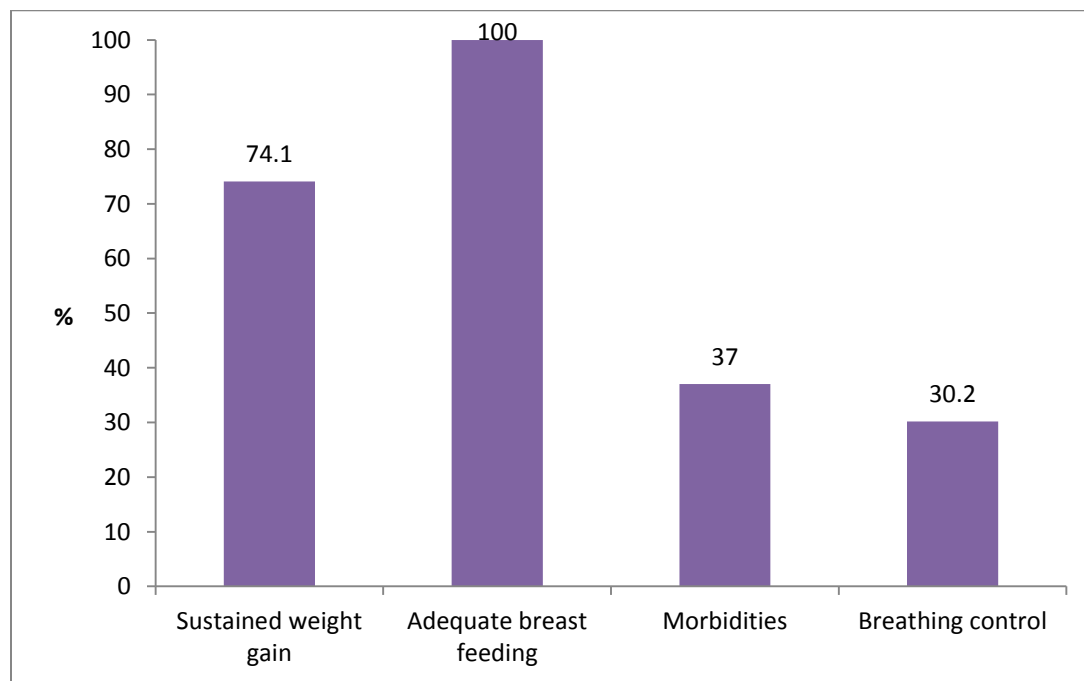


Fig 8: Consideration for preterm discharge

There was no indication that the preterm baby will be followed up in the home after delivery. Twenty six (100%) of the preterm babies discharged were not followed up in the home but booked at out-patient pediatric clinic after two weeks.

Discussion

In this study, 11(20.8%) of the mothers were treated with prenatal steroids during antenatal period. These findings are different from findings found in a study done in Philadelphia where all mothers (100%) who had preterm labour received betamethasone before delivery (Bastek, et al. 2008). In Latin America, six studies conducted between the years 1999-2009 reported the use of antenatal corticosteroids in preterm babies ranged between 4%-71% (Riganti, et al 2009). Also in 2000 in the 42 countries with 90% of the worldwide childhood deaths, the mean estimated coverage of antenatal steroids for the population at risk for preterm birth was only 5% (Jones, et al 2003). Antenatal corticosteroid, should be given to all women in preterm labour to prevent respiratory distress syndrome in premature babies and associated mortality and long-term impairment (Althabe, Belizan, Mazzoni, Berrueta & Jay, 2012). This intervention is highly recommended by WHO but remain under used in many low income countries (Lawn et al., 2012, 2013; Howson et al., 2013).

Preterm babies were resuscitated soon after birth whereby majority of them are suctioned (96.7), ambu bagging (36.6%), oxygen administration (82.9%6%), oxygen administration (82.9%) but chest compression rarely practiced at 4.9%. A study done by Natile et al., (2014) indicated that only 10.5% of the preterm babies were resuscitated at birth and administration of oxygen was rare only 16.2% were given nasal oxygen. According to Lawn, et al. 2012, basic resuscitation for preterm births reduces preterm deaths by about 10% in addition to immediate assessment and stimulation.

All preterm babies were kept warm immediately at birth whereby majority of them were kept warm 49(92.5) under the radiant warmer, 3(5.6%) skin to skin and 1 (1.9) was covered with a blanket and cap. However, it is recommended that after birth simple methods are used to keep the preterm warm. The baby is dried and put on the mother's abdomen (skin-to-skin) then both are covered with a warmed blanket (National Perinatal Association, 2013). Kattwinkel et al., 2010, states that even when the above interventions are used to kept the preterm baby warm, all resuscitation procedures can still be performed to include; endotracheal intubation, chest compression and insertion of intravenous line.

In the newborn unit, preterm babies were nursed in the incubator 20(37.7%) and 33(62.3%) were cared for under radiant warmer. Kangaroo mother care was provided to 24(45.3%) of the preterm babies. These findings are different from the study done in Uganda where none of the units involved in the study had a special room for care of preterm babies, nor did they promote kangaroo mother care. Instead preterm babies were wrapped in many cloths in order to keep them warm (Waiswa et al., 2010). In another study in Kenya in eight hospitals found that 7 out of 8 hospitals were having infant warming device in nursery (Opondo et al., 2009)

Only three (5.6%) of the preterm babies who were admitted were monitored temperature on admission to Newborn Unit. These findings are not different to a survey done in Kenya in eight hospitals which found that only 4 out of the 8 hospitals were taking basic neonatal observations

to sick neonates (Opondo et al., 2009). In a study done in North India on body temperature of newborns found that 11.1% of the newborns had hypothermia (temperature $<36.5^{\circ}\text{C}$) and 22.8% were hyperthermic (temperature $>37.3^{\circ}\text{C}$) (Kumar & Aggarwal, 1998). In another study on neonatal hypothermia in Uganda, rectal temperatures taken at 10, 30, 60 and 90 minutes postpartum showed that 29, 82, 83 and 79% of the neonates were hypothermic whereby 10% of the lowbirthweight babies were hypothermic (Byaruhanga, Bergstorm & Okong, 2005). It is recommended that the baby's temperature is assessed every 30 minutes for one hour, then every four hours for the first twenty four hours and every shift until discharge (National Perinatal Association, 2013). Ensure the temperatures are within 36.5°C - 37.5°C and a change in temperature should be investigated (National Perinatal Association, 2013). Preterm baby's temperature must be closely monitored because of the risk of hypothermia and even hyperthermia especially when using other technique of keeping the preterm baby warm e.g. placing the baby under radiant heat, pre-warming the room, placing the baby on an exothermic mattress and using heat resistant plastics (Kattwinkel et al., 2010).

For majority of the babies 41(71.7%), the time they were given a bath was not indicated, 9(18%) were given a bath within 24 hours of birth while 3 (6%) were bathed after 24 hours of birth. All neonates should be delayed to bathe up to 24 hours after delivery to prevent the baby from going into hypothermia (Gage, Ali, & Suzuki, 2005). It is necessary to postpone bathing of the neonate until thermal, respiratory and cardiovascular stability is established (National Perinatal Association, 2013).

More than a third of the preterm babies 16(30.2%) were initiated breast milk 24 hours after birth, a third 15(28.3%) in the first 24 hours. Only 1(1.9%) was initiated breast milk within 1 hour of birth, and 20 (37.7%) were initiated breast milk after 72 hours. In contrast, a study done in Ghana, on early initiation of breastfeeding and found that 29% of the newborns were initiated breastfeeding within 1 hour, 56% within 24 hours and 27% after 24 hours (Tawiah et al., 2008). In another study in Uganda, it was common to start feeding preterm babies on sugar water instead of expressed breast milk (Waiswa et al., 2010) Breastfeeding should be initiated within one hour after birth. This has been shown to reduce neonatal mortality (MOPH & MOH, 2012).

Preterm babies were initially feed through the NGT and as the weight increased to 1.7 kg they were gradually feed by cup and as the weight approached 2.0 kg they were breast fed and the fed complemented with feeding via the cup or NGT. This is in line with WHO recommendation that preterm babies have to be assisted with feeding until they are able to breast feed usually at a weight of more than 1.8 kg (Lawn et al., 2012).

There was no documentation on how the cords for preterm babies were cleaned during hospital stay. A recent cluster randomized trials have shown benefits from chlorhexidine topical application to the baby's cord with no adverse effects (MOH, 2012). Use of 4% CHX was found to be more effective if offered within the first 24 hours of birth, and it seems that even a single application is effective (Karumbi et al., 2013). A study done in Bangladesh on the effects of cord cleansing with chlorhexidine on neonatal mortality found that there was lower neonatal mortality

in the single cleansing group 22.5/1000 live births than it was in the dry cord care group 28.3/1000 live births (Arifeen et al., 2012).

There was no documentation of relevant health messages shared to the parent of the preterm baby. A study done on newborn care in Rural Uttah showed that only a small proportion reported that they got information about cord care (7%), breastfeeding (5%) and thermal care (5%) (Baquil et al., 2007). Parents of the preterm baby and the community should be taught on care of preterm babies (Waiswa, 2010). In another study in Nepal found that only 3% of the mothers had received health education during the antenatal period (Bolam et al., 1998). Parents should be supported and involved in the discharge process as this gives them confidence to care for the baby at home. They are taught how to recognize danger signs on the preterm baby, importance of infection control, care of the preterm and the importance of follow up (Jefferies, 2014; National Perinatal Association, 2013).

Twenty-seven (50.9%) of the pre-terms' were discharged based on breastfeeding adequately, 20(37.7%) sustained weight gain, 10(18.9%) on morbidities experienced by the preterm baby while 16(30.2%) based on ability to control the breath with an apnea free period of 5-7 days. Discharge for the extremely preterm babies depends on the morbidities they experience during the hospital stay. Sepsis, necrotizing enterocolitis (NEC), Broncho-pulmonary dysplasia (BPD) and surgery will prolong their stay (Hints, et al. 2010). Preterm babies with < 34 weeks' gestation should be discharged from the newborn unit once the baby has attained physiological maturity in four areas; maintain temperature of 37^{0c} when fully clothed in an open cot, control breathing with an apnea free period of sufficient duration (5-7 days), respiratory stability by maintaining Sao₂ >90-95% in room air, sustained weight gain and successful feeding by breast and or bottle (Jefferies, 2014).

There was no indication that the preterm baby will be followed up in the home after discharge from the Newborn Unit. This finding is similar to a study done in Uganda where there was no follow-up for preterm babies (Waiswa et al., 2010). Twenty seven (50.9%) of the preterm babies who survived and were discharged home, were not followed up in the home but booked in out-patient paediatric clinic after two weeks of discharge from the unit. All preterm babies should be followed up at home within 72 hours of discharge by a qualified health care professional who assesses the infants continued stability and morbidities experienced. Then, they are followed up weekly until the infant reaches 40 weeks of corrected gestational age. They are also booked for medical or surgical and pediatric review as necessary (AWHONN, 2013; Jefferies, 2014).

Conclusions

From the study findings, it is evident that Kisii Teaching and Referral hospital is using evidence based practices. However, they are not adequately utilized. Antenatal corticosteroids were given to some mothers during preterm labour. Resuscitation of the preterm baby was promptly done and majority of the preterm babies were just suctioned, or ambu bagged or and given oxygen.

Immediate care included keeping the preterm baby warm, administration of oxygen and intravenous fluids. Physical examination and monitoring of the temperature soon after admission was done to very few preterm neonates. There was delay in initiating breast milk where majority of the babies were given breast milk after 24 hours of birth.

There was poor documentation of the procedures done to the preterm baby. There was no record when the baby was first top-tailed, how and when the cord was cleaned and the health messages shared with the mother.

Kangaroo mother care was practiced intermittently only to those preterm babies who were stable. Home visit for preterm babies after discharge was not practiced.

Recommendations

The Ministry of Health, Kisii county Government through the hospital management should ensure all staffs working in the newborn unit are trained on preterm care to improve knowledge, skills and attitude of staffs.

Emphasis should be put on the importance using evidence based practices in the care of preterm babies. All preterm babies should be examined on admission and vital observations monitored frequently. KTRH administration should also make certain that proper documentation of all procedures done to the preterm babies is completed by all staffs.

The KTRH should ensure relevant health messages are shared to mothers/parents of preterm babies (care of their babies, importance of kangaroo mother care, importance of breast milk and exclusive breast feeding, family planning, immunization, weaning and importance of follow up) and if possible involve their families and the community. The health education should start from the antenatal period and continue during the postnatal period.

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