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Neonatal Mortality and Neonatal Health Services in Wad Madani Pediatric Teaching Hospital

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ABSTRACT

The main objectives of this study are to describe the neonatal health and neonatal health services in Wad Madani Teaching Hospital also to identify the problems which cause death.

Methodology: This is a descriptive retrospective study carried out in Wad Madani Pediatric Teaching Hospital, in a period from January to October 2003. Data was collected from hospital records; observation and interview.

Results: the majority of deaths were due to prematurity 33.3%, neonatal sepsis 24.3% and birth asphyxia 20%. The neonatal mortality (NM) to total neonatal admission from January to October 2003 was 14.6% and 41.9% of total hospital deaths.

Conclusion: Our conclusions ; Neonatal death in Wad Madani Teaching Hospital was found to be significantly high , strengthening of referral system recommended and special equipments that are not available in the Wad Madani Pediatric Teaching Hospital should be provided.

Key word: Neonatal, mortality, Wad Madani

INTRODUCTION

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Pediatrics now is the focus of attention; most of the neonatal problems are preventable and treatable so it becomes the integral part of total care, intensive research and statistical analysis.

Infant mortality (IM) is an important indicator of health status and of socioeconomic condition of a particular community .In addition, IM is also a sensitive indicator of the availability, utilization, and effectiveness of health care, particularly perinatal care [1]. Perinatal mortality reflect both social and health conditions of a population and the standards of obstetric and pediatric care [2] . About tow thirds of the infant mortality occurs in the first month of life from asphyxia, birth trauma, infection, prematurity and malformations. During first week, mortality is due to sepsis, pneumonia, meningitis and diarrheal diseases. Global estimates showed 126 million births, eight million infant deaths, five million neonatal deaths, and about three million early neonatal deaths [3] .

Despite the early attention to neonatal health related services in Sudan, neonatal mortality rates are still unacceptably high. Neonatal mortality rate was recently estimated at 31:1000 live births and compromised 46% of total infant deaths and about 96% of deliveries took place at home [4].

Special care unit is for infants requiring less intensive therapy on observation with condition such as neonatal jaundice, transient respiratory disorders and very low birthweight, but asymptomatic infants. This level of care require a patient to nurse ration 1:1Major advantage of the infant care centre is that it permits attention to very sick babies [5] .

The objectives of this study are; (1) assessment of neonatal health and neonatal health services in Wad Madani Pediatric Teaching Hospital (WMPTH) (2) to measure neonatal death rate in (WMPTH) duing the period (Jan October 2003) and to identify the risk factors related to neonatal death (3) also to evaluate the neonatal health services in order to formulate recommendations to improve neonatal health services.

MATERIALS AND METHOD

Study site

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Wad Madani pediatric hospital was established in April 1987. It has 14 wards for patients belonging to 7 units. It is located in Wad Madani city which is about 180 km south of Khartoum the capital of Sudan .The hospital contains medical and surgical departments that cover all Gezira State which is an extended state with a total population of about three millions .

Study design

This is a descriptive retrospective study carried out in Wad Madani Pediatric Teaching Hospital.The study describing the present situation of neonatal health and neonatal services in (WMPTH).

Sample technique and sample size

All recorded neonatal deaths in (WMPTH) during the period (Jan Oct 2003) were reviewed. 210 death records were included in this study.

Methods of data collection

> 1.Hospital death records were reviewed addressing, age, sex, residence, weight, date of admission and date of death, site of delivery ,mode of delivery and cause of death.

> 2.Observation (using observational checklist) to describe the current conditions of equipment and to identify general problems.

> 3.Interview with responsible staff to know the ideal neonatal services, qualification of the staff and to identify problems and propose solutions.

Data analysis:

Data was analyzed manually.

Definition:-

  The following definitions were adapted in this study:

> 1.Neonatal mortality: deaths that occur during the first months (actually the first 28 days) of life

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2.Neonatal mortality rate: the number of deaths that occur during the first 28 days of life per thousand total live births.

3.Morbidity: refers to illness, thickness, injures   etc.

4.Low birthweight: infants weight less than 2.5 kg and have a crown level length of less than 47 cm (gestational age from).

RESULTS

Total number of patients included in this study was 210 .About 64% were males and 36% were female .Neonatal age at the time of admission was distributed as 92/210 (42 %) are less than l day, 79/210 (37 %) 1-7dayes , and 39/210 (19.6%) are more than 7-28 days. Regarding the residency 35% were urban, 38% were rural and 27 % were not recorded.

The neonatal weight was distributed as; 53% were less than 2.5 Kg and 47 % were 2.5 Kg or more.

Fig (1):- Shows neonatal death distribution according to age:
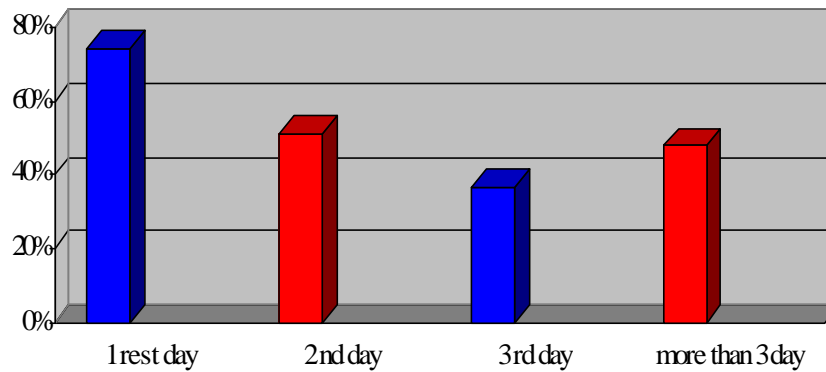
Regarding the date of death, 35 % died in the lst day of admission, 24 % died in the 2nd day of admission, 17. % in the 3rd day and 23 % died after more than three days.

Regarding the side of delivery ,we found that 57 % at hospitals , 27 % at home , while 17% were not recorded .Of those delivered at hospital 46.3% were rural , 27.7% were urban and 26% not recorded .Regarding the mode of delivery 68% were outcome of vaginal delivery , 23% by lower segment caesarean section and

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9% were not recorded .10% out of 23% delivered by lower segment caesarean section were rural residence .

Table (1):- Shows neonatal cause of death distribution.

Cause of death	Percentage
Premature	34
Neonatal sepsis	24
Birth asphyxia	20
Neonatal tetanus	7
Pneumonia	5
Respiratory distress syndrome	3
Failure to thrive	2
Low birth weight	2
Congenital abnormality	2
Neonatal jaundice	1
Others	1
Total	100

The majority neonatal death 34 % were premature, death due to neonatal sepsis came next 25 % and the birth asphyxia came third 20%.

Fig (2) shows that the complications associated with preterm in 54.3% distributed as: preterm & Respiratory distress syndrome 25.7% Preterm +birth asphyxia 20% and preterm & sepsis 9 %.
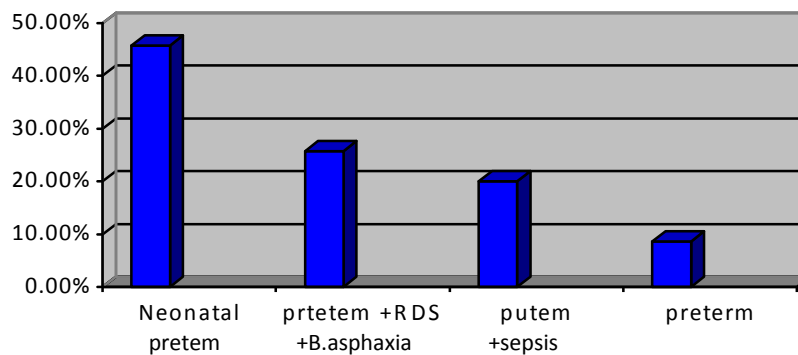

Fig (2) complications associated with preterm

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RESULTS OF OBSERVATION AND CHECK LIST

The neonatal unit is a single room partially separated into two parts: one room 5 (5) meters, with six windows 3 located in northern direction and 3 in the southern direction, place is not adequately ventilated, there is one way for going in and out, there are 5 beds one for every 3 neonates.

No special room for the staff. No co-ordination related to the visiting of the neonatal room. Neonatal feeding usually performed by co-patients.

Check list: For special equipments and machines which are important for neonatal health services.

Equipment	Not available	Available Number	Functioning	Not functioning
Incubators		5	2	3
Weight scale		1	1	-
Photo therapy machine		2	2	-
Thermo regular machines		1	1	-
Mechanical ventilation (ambo bag)	-			
Ventilolator		1	1	-
Oxygen monitor	-			
Endotracheal tube	-			
Autoclave	-			
Suction machines		1	1	-
Thermometer		1	1	-
Room temperature moniter	-			
Cut down set	-			
Lumber puncture set	-			
Exchange blood set		1	1	-
Gloves &theater clothes	-			

RESULTS OF INTERVIEWS

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The sister who is responsible of the Neonatal Department was well trained and have good experience in Neonatal Intensive Care Units (NICU) for 12 years, she has neonatal care diploma from University of Khartoum Faculty of High Nursing. The staff consists of seven nurses and three sisters, inaddition to four trainees.

PROBLEMS FACING THE WORK IN NEONATAL INTENSIVE CARE UNIT
1-referral system:

Wad Madani Pediatric Teaching Hospital covers all Gezira state for neonatal services. Because of lack of neonatal service in Wad Madani Maternity Hospital they refer neonates who need oxygen or sick to the Pediatric Hospital .The distance between the two hospitals is about half kilometers far away .The referral of the neonates is the responsibility of their parents.

2 Neonatal room:

The room is small for the high neonatal admission rate compared to the total hospital admission and beds are not enough. Sick neonates are two or more in one bed. This lead to cross infection to the neonate .The room is not well ventilated, not cleaned, and not sterilized.The uncontrolled large number of visitors entering into the neonatal room can lead to contamination.

Regarding the equipments: most of available one is not functioning.

Investigation: most of them are done.

Drugs: all important drugs are available.

Nutrition: There is a nutritional department specialized for the neonatal nutrition.

Suggested solutions:

1.   Training and qualification of the staff (one nurse for every 2 patients).

2.   Registrar available 24 hours in department.

3.   Unit technician to observe the equipment, sterilization, repair. Cleaning is the responsibility of the nurse.

4.   Bed for each neonate.

Many units are required:

1.   Unit for clothes and washing hand .

2.   Single neonate.

3.   Intensive care unit.

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4.   Emergency unit.

5.   Sterilization unit.

6.   Unit for nurses and doctors.

7.   Unit for mother for breast feeding.

The interview held with senior sister showed that the neonatal room in Wad Madani Pediatric Hospital is not an ideal room for neonatal health services; insufficient staff number and lack of trained nurses for equipment and neonatal care. The poor condition of neonatal room and equipment lead to cross infection and contamination of neonates contributed to the high neonatal mortality in hospital, Most of investigations are donee but some were not available. Essential drugs are available.

DISCUSSION

Very few studies have investigated the link between resources for health and health   outcome. Investment resources for health must be consider as a part of strategy to a achieve the Millennium Development Goals of improving maternal health and child mortality.

The neonatal mortality (NM) to total neonatal admission from January to October 2003 was about 15 % and it represents 42 % of total hospital deaths. This is slightly higher than in 2002 (40%), 2001(35%) .However the NM in Wad Madani the rate is lower than the overall rate of 64% for [4] . Compared with neonatal mortality rate in Cairo 30% in 2002[6] , in England which was as low as 5/1000 life births[7] and 4 /1000 live births in USA in 2000[8] . Neonatal mortality and morbidity rates in the African Region is currently estimated at 45% death per 1.000 live births, and thus it is among the highest in the world, and contributes about 50% of the infant mortality rate in the Region according to WHO [9] .

The majority of neonatal deaths were in low birth weight group 54%, and most of them in the neonates admitted in the age group less than 24 hours 43 % .1st 24 hours +1-7 days is estimated as 80% . This is possibly due to delayed referral system, contamination of sick neonate when handing him for many hours to hospital and this may lead to aggravation of his condition and death within a few

hours. In addition, low birth weight is considered as a factor which influences the mortality risk [19] and one of the four categories of high risk neonates [20] . A multicenters prospective study involving 4267 deliveries in eight countries was undertaken over a period of three months.It showed that low birth weight contributed a large proportion of the high neonatal mortality of about 16 % compared to about 2 % for normal birth weight babies 24 hours after birth. The mean mortality by 24 hours post delivery was about 4 % .Obstetrical complications are important risk factors for asphyxia of the newborn. Among the important risk factors are those associated with prolonged labour and intra partum accidents [10] . In Finland the over all incidence of respiratory distress syndrome was (76%) [11] .

The majority of deaths occur in the first day of admission 35 % , this means that the cause of death is an acute problem probably due to hypoxia or hypothermia , related to poor oxygen supplies and bad incubators facilities .

The majority of neonatal deaths were delivered at hospital 57 %, most of them were from rural 47 %.This is due to the fact that women who delivered at hospital has complicated pregnancy and delivery. This reflects a problem of antenatal care in rural areas .Clinical evaluation of a newborn should include consideration of aspects of the maternal and obstetric history including labour, delivery and medication [19]. Out born status is one of risk factors of neonatal mortality as shown in a study done in Canada [21].

The majority of neonatal deaths were delivered vaginally (69 %). This may be due to contamination of neonates because of lack of maternal services and poor antenatal care for safe delivery. Immediate care resuscitation of neonates and sufficient referral system influence neonatal health and mortality and save them from contamination .A study carried out in Kenya indicated that; compared to caesarian delivery, infant born via spontaneous vertex delivery had higher mortality. The leading diagnosis on admission or death were respiratory distress, apnoeic attacks, suspected sepsis, jaundice, hypothermia and anaemia. [12]

In United Kingdom a study showed that; infants delivered by forceps after attempt ventose delivery were the likeliest to have a subdural hemorrhage, with a rate of

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28% . The risk was 6% after normal vaginal delivery and 8% after ventose delivery [13] . Study carried out Jordan to evaluate the mode of delivery on neonatal outcome ,showed that ;cesarean delivery for vertex-vertex presentation did not improve the neonatal outcome .Rather the incidence of respiratory distress syndrome was significantly greater in this group delivered by caesarean section had a lower incidence of neonatal mortality [14] .

Preterm birth is one of the major problems in perinatology today .It is associated with increased risk of neonatal infection and related neonatal mortality.The majority of neonatal deaths about 33 % were premature.Death due to neonatal sepsis came next about 24 % and the birth asphyxia came third about 20 %. Prematuraton is estimated as a high risk factor influencing neonatal mortality [19, 20], which was found to be one of common causes of neonatal deaths in study done in Canada [21].

In Jordan the neonatal mortality rate fell with increasing birthweight from 532 per 1000 at 1.5 kg to 16 per 1000 at 1000 at 2.5 kg. Also it showed that the risk factors were mainly prematurity, low birthweight, pregnancy-induced hypertension, lack of proper antenatal care, birth asphyxia, and malpresentations

[15].

The majority of deaths were preterm complications 54% .High mortality ate may be due to acquired problems and contamination due to absence of an isolated room for preterm, admission of a number sick neonates in one room which lead to cross infection [6] .

Also lack of equipment for oxygen incubation is a risk factor as we know that preterm has weak respiratory muscles [7]. Infection is one of the most common cause of infant morbidity and mortality in neonatal intensive care units , despite the availability of various therapeutic medical interventions. [16] . It is a major contributor to high mortality rate in very young infants in developing countries. Most likely bacterial cause: streptococcus pneomoniae, group of streptococcus, staphylococcus aureus, and gram negative enteric organisms especially E. coli [17]. Early onset of bacterial infection is an important cause of morbidity and mortality in newborn infants. Various factors that increase the risk of neonatal infection

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have been identified .It is unclear whether asymptomatic newborn infants born to mothers with one or more of these risk factors should receive antibiotics prophylactically rather than selectively if only clinical or microbiological evidence of sepsis emerges [18] .

Inspite of technology dependent infants with whom we are dealing , no oxygen monitor lead to high oxygen tension cause alveolar rupture and retinal detachment [7] , Lack of ideal incubators with temperature monitor contributes the high mortality of preterm infants.

The neonatal department is not ideal, its poor condition contributes to the high morbidity and mortality rates due to cross infection.It is known that high mortality in preterm without complications is most probably due to acquired infection and poor services.

CONCLUSION

Neonatal death in Wad Madani Pediatric Teaching Hospital was found to be significantly high .Strengthening of referral system is recommended and nessary equipments that are not available should be provided.

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