FACTORS ASSOCIATED WITH CLINICAL SEPSIS IN NEONATES ADMITTED IN IGANGA HOSPITAL: A CROSS-SECTIONAL STUDY

BY

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Declaration

I the undersigned, declare that this dissertation is my original work, except where due acknowledgment has been made. I declare that this work has never been submitted to this University or any other institution for funding / for partial fulfillment for any award.

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Dedication

I dedicate this work to my lecturers and my family.

Acknowledgment

I wish to express my gratitude towards my supervisors for their immense input throughout this dissertation and my family for the support accorded to me.

OPERATIONAL DEFINITION

Neonatal period: Refers to the first four weeks of life after birth.

Neonatal Sepsis: This refers to a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first four weeks of life

Neonatal mortality**:** Death during the first four weeks of life.

Neonatal infections: These are infections acquired by neonates in the first four weeks of life.

Premature rupture of membranes**:** This refers to the rapture of the amniotic sac before labor begins

Pregnancy-induced hypertension: Development of high blood pressure in a pregnant woman after 20weeks of gestation.

Gestational Age: This is a term used in pregnancy to describe the duration of pregnancy.

Apgar score: This is a scoring system used to assess the physiological well-being of newborns one minute and five minutes after birth.

ABBREVIATIONS

ANC: Ante Natal Care.

APH**:** Antepartum Hemorrhage.

DHIS**:** District Health Information System.

HMIS**:** Health Management Information System.

MOH: Ministry of Health.

PROM: Premature Rupture of Membranes

STI**:** Sexually Transmitted Infection.

UBOS**:** Uganda Bureau of Statistics.

UNFPA**:** United Nations Population Fund.

UNICEF**:** United Nations International Children's Emergency Fund.

USAID**:** United States Agency for International Development.

UTI: Urinary Tract Infections.

WHO: World Health Organization.

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Abstract

Neonatal sepsis is the second commonest cause of neonatal mortality and morbidity after asphyxia and is responsible for about 30% to 50% of total neonatal death in developing countries each year. With a global neonatal death of 2.5million per year and a very high and stagnating neonatal mortality rate of 27 per 1000 live births in Uganda for the last 15 years amidst all interventions, it is important to understand the contributing factors to this high and stagnating mortality rate. The objectives of this study therefore were to determine the prevalence and factors associated with clinical sepsis among neonates admitted to Iganga hospital.

The study was a cross-sectional survey using hospital-based records of 424 neonates admitted in the neonatal unit and their index mothers collected during hospital delivery. Data were analyzed at three different levels of univariate, bivariate, and multivariate. Chi-square tested for statistical significance and multivariate analysis was by logistic regression.

This study found that the prevalence of clinical neonatal sepsis in Iganga hospital was 36.1%. The study also found that maternal obstetric and neonatal factors were associated with clinical neonatal sepsis. The Maternal obstetric risk factors for Neonatal sepsis included; having a foul-smelling per vaginal discharge (AOR=11.2; 95%CI 5.6-22.4), prolonged labor ≥24hours (AOR=2.1; 95%CI 1.01-4.45), developing UTI during pregnancy (AOR=38.1; 95%CI 13.6-106.9), and gestational age of ≥ 36 weeks (AOR=9.1; 95%CI 2.4-34.30). Also, this study found that neonatal risk factors for neonatal sepsis were; birth weight ≥2.5 kg (AOR=3.3; 95%CI 1.4-7.7), and Apgar score ≥7 (AOR=6.7; 95%CI 3.7-12.0).

From this study, it emerges that there is a need for deliberate efforts to reduce the high rates of neonatal sepsis in Iganga hospital. Further, mothers with foul-smelling vaginal discharge and

those who develop urinary tract infections during pregnancy need to be screened, identified, and treated early and effectively to minimize the risk of developing neonatal sepsis.

INTRODUCTION

1.0 BACKGROUND

Globally, 2.5 million children die in the first month of life due to conditions and diseases associated with a lack of quality care at birth or immediately after birth, complications of prematurity, and infections (WHO, 2019) .The global burden of disease study 2016/2017 estimated 1.3 million annual incidence cases of neonatal sepsis worldwide resulting in 203000 sepsis attributable deaths(Fleischmann et al., 2021).The incidence of neonatal sepsis reported from various studies widely varies because of the differences in population studied ,criteria of case definition and diagnosis. Neonatal infections are estimated to account for 26% annual deaths with high mortality rates in sub Saharan Africa. Annualy,its estimated that 380000 to 2000000 cases of neonatal sepsis occur in sub Saharan Africa with 270000 attributable deaths (Ranjeva et al., 2018). To attain the third sustainable development goal, all countries have to reduce neonatal mortality to less than 12deaths per 1000 live birth by 2030 (Ma et al., 2019).

This goal may not be attained without significant reduction of neonatal mortality related to infection.

Neonatal sepsis is described as a clinical syndrome characterized by signs and symptoms of infection with or without accompanying bacteremia in the first month of life after. It includes septicemia, pneumonia, osteomyelitis, meningitis, and arthritis. A positive blood or viral culture is the gold standard for the diagnosis of neonatal sepsis. However, a young infant study group by WHO developed criteria for diagnosing neonates with sepsis which includes the use of the following, temperature above 37.5 ^{o}c, or felt hot to touch, convulsions(active or by history), fast

breathing above 60 breaths per minute, cyanosis, severe chest in drawing, nasal flaring, grunting, bulging fontanels, pus from the ear, umbilical cord redness extending to the skin, feels cold (by history), not able to feed, less than normal movements, and inability to attach breast (Kayom et al., 2018). Despite this algorithm having a high sensitivity and low specificity it helps to identify a large proportion of neonates with sepsis and is widely used for clinical and research purposes in low resource settings.

Neonatal sepsis is a clinical syndrome including septicemia and meningitis that is classified according to disease on set. Early on set sepsis (EOS) is defined as disease among neonates at 72hours or less while late on set sepsis occurs 4 to 28 days. Early on set usually results from an infection acquired in utero or during birth(Id et al., 2020).

In Uganda, the neonatal mortality rate is at 27 per 1000 live births and this has stagnated for the last 15 years amidst all interventions (UBOS, 2016).

The neonatal mortality due to sepsis in Uganda is at 18.2 % of all neonatal death (Unicef, 2019)

The government of Uganda through its ministry of health has put various mechanisms to reduce neonatal mortality such as improving the availability and access to utilization of quality maternal and newborn care (John et al., 2015), strengthen human resource, and building capacity to provide maternal and newborn care, advocate for increased allocation of resources for maternal and newborn care, strengthen coordination of maternal newborn care, empower communities to ensure a continuum of care between the household health care facility, and strengthening monitoring and evaluation mechanism (MOH, 2015).

Despite the interventions, neonatal sepsis remains a challenge. In Iganga district, in 2016, 11983 deliveries were conducted with 383 cases of neonatal sepsis reported (DHIS2 January – December 2016, unpublished report).In 2017, 12448 deliveries were conducted with 377 cases of neonatal sepsis reported (DHIS2 January –December 2017).In 2018, 13810 deliveries were conducted with 267 cases of neonatal sepsis reported (DHIS2 January-December), and in 2019 13832 deliveries were conducted with 317 cases of neonatal sepsis. A study by John et al 2015 was conducted in Eastern Uganda in Kidera HC 1V Buyende district to determine risk practices and factors associated with neonatal sepsis and found that lack of antenatal care or access to it and poor breastfeeding by sick newborn children was a major cause of neonatal sepsis. The study also found that laboratory-diagnosed neonatal sepsis was at 21.8%(John et al., 2015).

This study therefore, was to determine factors associated with clinical neonatal sepsis in Iganga hospital.

1.1 Problem Statement

Globally 2.5 million children die in the first month of life annually (WHO, 2019).In developing countries, 30% to 50% of these deaths are due to neonatal sepsis (Getabelew et al., 2018).In sub Saharan Africa, neonatal mortality due sepsis is 26% of the neonatal deaths (Ranjeva et al., 2018)

The neonatal mortality due to sepsis in Uganda is high at 18.2% (Unicef, 2019). In Iganga hospital, the neonatal mortality rate due to sepsis has persistently remained high for the last three years estimated at 23.94 %(DHIS2 2019) which is high compared to the Country's neonatal mortality rate due to sepsis estimated at 18.2% (Unicef, 2019).This gap has to be addressed in order to reduce the cause specific mortality due sepsis. For a long time, appropriate antenatal care and clean deliveries by trained health workers have been encouraged and practiced by

Iganga hospital staff but despite these measures, admissions due to neonatal sepsis to this hospital are still high. Suspected factors responsible for high neonatal sepsis in this hospital include maternal demographic and obstetric factors and also neonatal factors.

This study therefore was to determine the prevalence of neonatal sepsis and associated factors in Iganga district hospital.

1.2 Main objective

The main objective of this study was to determine factors associated with clinical sepsis in neonates admitted to Iganga hospital.

1.3 Specific objective

1. To determine the prevalence of clinical neonatal sepsis at Iganga Hospital.
2. To determine factors associated with clinical neonatal sepsis at Iganga Hospital

1.4 Research Question

What are the risk factors associated with the development of sepsis in neonates admitted in Iganga district hospital?

This research question is based on the hypothesis that neonatal factors, maternal demographics, maternal obstetric history are positively associated with neonatal sepsis.

1.5 Justification

Neonatal mortality due to sepsis is still a challenge in Iganga hospital hence the need to carry out this study. According to the HMIS and DHIS2 report 2018, it stands at an average of 23.9% and no study has been conducted to specifically find out why such a high prevalence.

The results of the study will enable the hospital authorities and staff to know the factors sustaining the high neonatal sepsis in their hospital and devise mechanisms of addressing them.

The district authorities will be able to make necessary adjustments to their work plans basing on the results of the study.

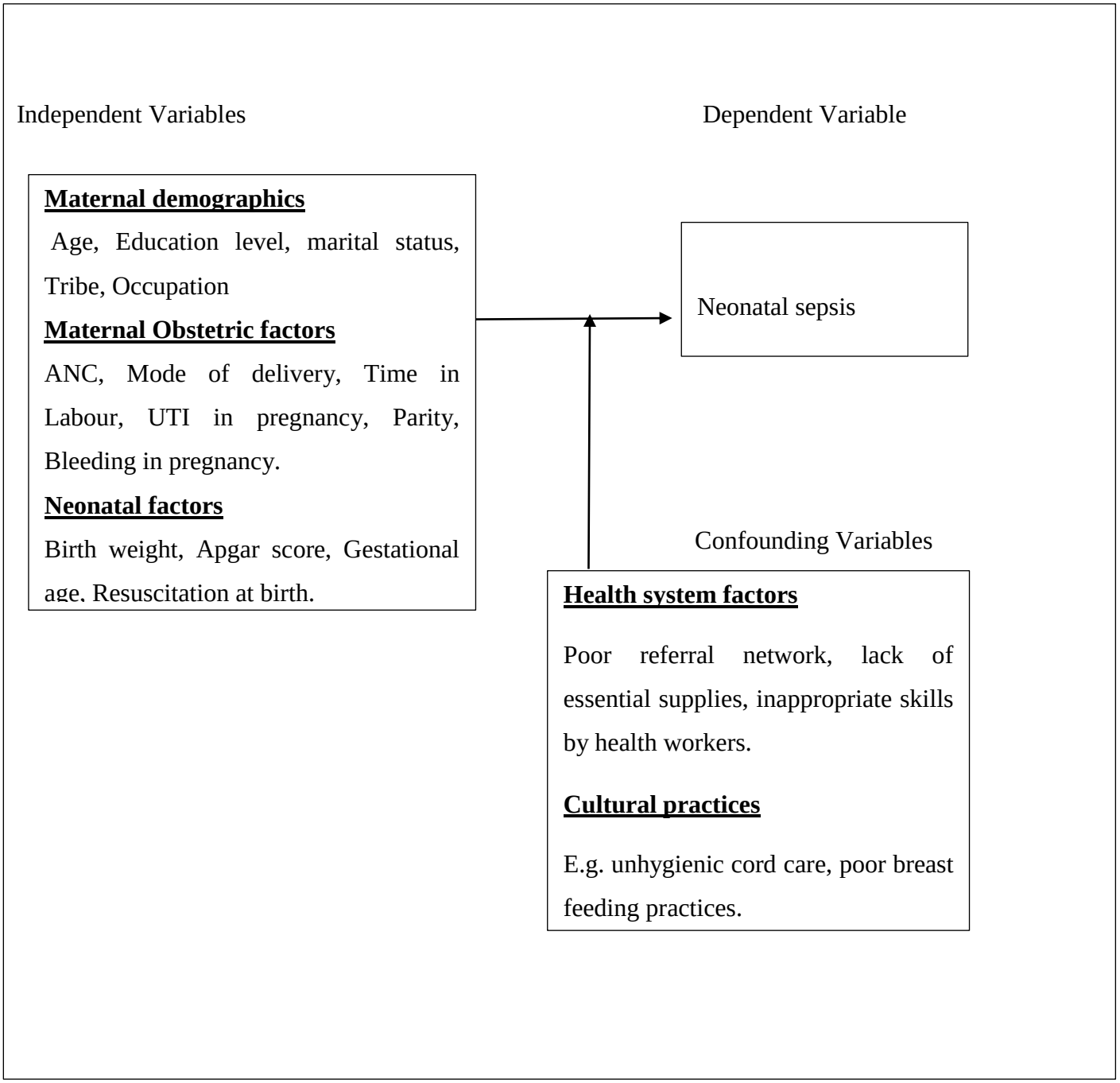
The results of the study can also influence policy for example staffing and strengthening maternal and child health in health training institutions.

Iganga district authorities can use the results of the study to lobby for more resources from the government and stakeholders to strengthen maternal and child health services

1.6 CONCEPTUAL FRAMEWORK

The conceptual framework was developed from a thorough review of the extant literature on neonatal sepsis. This conceptual model depicts the relationship between clinical neonatal sepsis, maternal demographics, neonatal factors, and maternal obstetric factors. It also shows possible confounding factors such as health system factors and cultural practices. The conceptual model is illustrated in Figure I below;

Figure 1: Conceptual Framework



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