

An Evaluation of Antenatal Screening Services Provided in Health Facilities of Lundazi District, Zambia

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Abstract

Background: Provision of quality Antenatal care requires holistic screening and timely treatment to prevent neonatal and maternal mortalities.

Methods: A facility based cross-sectional study evaluated antenatal screening services offered in Lundazi District, Zambia. The study was conducted between October 2019 and June 2020. Study units comprised 5 health facilities, 60 ANC mothers and 75 ANC providers. The study used facility audit, observation and self-administered questionnaires.

Results: The study found that ANC mothers could not be weighed in all the health facilities due to dysfunctional weighing scales. Facilities lacked Multistix for urine testing. Facilities could not test for blood grouping or screen blood for Rhesus factor. One facility could not screen for HIV and Malaria as reagents were out of stock. Another facility could not screen Haemoglobin levels for anaemia as the Hamaeue machine was dysfunctional. Routine ultrasound was not done in all the five facilities.

Conclusion: Lack of functional equipment and essential supplies used for screening ANC mothers for any abnormality is a significant missed opportunity for early diagnosis and timely treatment of medical conditions. Reinforcing this component improves provision of quality antenatal care. Therefore, increased Antenatal care coverage requires a simultaneous scale-up of ANC equipment, supplies and drugs.

Keywords: Antenatal care providers, Antenatal care Users, screening, equipment.

Introduction

Antenatal care (ANC) is one of the key components of safe motherhood. It is defined as the care given to a pregnant woman from the time she reports to the health facility to delivery (Phommachanh et al., (2019). Ricci (2013); WHO (2016) outlines the aims of Antenatal care as- screening and detecting high risk cases, quick initiation of treatment for any identified ailment among others. It is cardinal for every pregnant woman to be holistically screened of any ailments and treated to prevent neonatal and maternal mortalities.

According to Yusuf and Saidu (2015); Conrad et al., (2011), ANC benefits both the mother and the baby; it assists in screening, diagnosing and managing or controlling the risk factors that might adversely affect the pregnant woman and or the pregnancy outcome.

World Health Organisation (WHO) (2016) recommends that every pregnant woman should be screened of the following; haemoglobin (HB) level to rule out anaemia, Random Blood Sugar (RBS) to rule out Diabetes mellitus, Rhesus type for blood incompatibilities, Rapid Plasma Reagin (RPR) for detection of syphilis and HIV Test for Human Immune Virus (HIV). Areas endemic for malaria, an additional Rapid Diagnostic Test (RDT) is undertaken during the first ANC visit and whenever the Haemoglobin level is less than 11 grams per decilitre (WHO 2016). At initial and subsequent antenatal visits, urine is screened for the presence of glucose to rule out diabetes, proteins for early detection of hypertensive disorders such as pre-eclampsia and urinary tract infection while ketones are also checked for hypoglycaemia.

Blood pressure check is a vital procedure for the detection of hypertensive disorders in

pregnancy. If hypertensive disorders are not detected and treated accordingly, they have an adverse effect on the maternal and fetal wellbeing (Fraser and Cooper, 2009; WHO 2016; Ricci, 2013). The same scholars stressed the importance of weight check in all women. Women with a Basal Metabolic Rate (BMI) in the obese range are more at risk of complications of pregnancy which include gestational diabetes, pregnancy induced hypertension (PIH) and shoulder dystocia (Ricci, 2013). Overweight or underweight women should be carefully monitored and offered nutritional counselling (Fraser and Cooper, 2009; Ricci, 2013).

During abdominal examination, the symphysis fundal height - the distance measured with a tape measure to determine fetal growth, is done to rule out polyhydraminous, twin pregnancy or big baby if the height of fundus is more than 4cm when compared to the gestational age and intra uterine growth restriction if less (Fraser and Cooper, 2009; Ricci, 2013). Ricci (2013), observes that fetal heart rate measurement is integral to fetal surveillance throughout the pregnancy. The same writer affirms that auscultating the foetal heart rate with a hand-held Doppler or a fetoscope at each prenatal visit helps confirm that the intrauterine environment is still supportive to the growing fetus.

According to WHO (2016), all pregnant women should be screened using ultrasound machine.

Ultrasonography has become a very useful diagnostic tool in obstetrics (Lama et al., 2020). It provides information about fetal activity, growth, gestational age, assess fetal wellbeing, malformations in the fetus and measurements can be made accurately (Ricci (2013).

Zambia follows the WHO (2016) Antenatal care guidelines. Non-availability of functional equipment or availability of non-functional equipment during the screening process or examination of the client would affect the quality of Antenatal care given to the pregnant women. Conditions would not be diagnosed and treated early and this would affect the fetal and maternal wellbeing.

Lundazi District's mean ANC coverage record from 2010 to 2018 stood at 86%. Naturally, as Antenatal coverage increased, it was expected that the district records a correspondingly lower numbers of maternal deaths if all other factors such as Antenatal care, labour management and

Post-natal Care were flawless. Despite a remarkable ANC coverage profile, Lundazi District was blighted by exceptionally high numbers of maternal deaths. The district recorded 170 maternal deaths in the same period. The observed weak relationship between ANC use and maternal mortality motivated the researcher to evaluate Antenatal screening services provided in health facilities of Lundazi district during the provision of antenatal care.

Materials and Methods

A facility based cross-sectional study was conducted between October 2019 and June 2020 in Lundazi District, Zambia. Antenatal screening services provided in health facilities of Lundazi district were evaluated. Facility audit was carried out in five (5) study facilities selected purposively based on the high maternal referrals some of whom died during labour or after childbirth. 75 ANC providers with an experience of not less than five (5) months participated in the study. 60 ANC users, sampled using simple random sampling method. A self-administered questionnaire was used to collect data from ANC providers. The study also used the Maternal and new born Quality of Care Survey Antenatal Care Observation Checklist for facility audit.

Quantitative data was then entered and analyzed with the use of the Statistical Package for Social Sciences program software (SSPS Version 23). For qualitative data, identified themes and subthemes were reviewed were grouped together. Qualitative data was then triangulated with quantitative data to give an in-depth understanding of the quality of antenatal care provided to pregnant women.

Results

This study found that ANC mothers could not be weighed in all the health facilities due to dysfunctional weighing scales. Facilities lacked Multistix for urine testing. Facilities could not test for blood grouping or screen blood for Rhesus factor. One facility could not screen for HIV and Malaria as reagents were out of stock.

Another facility could not screen Haemoglobin levels for anaemia as the Hamacue machine was dysfunctional. Routine ultrasound was not done in all the five facilities.

Discussion

This research work which is an extract from the main study ‘assessing the quality of Antenatal care provided to pregnant women in Lundazi district health facilities, Zambia’ aimed at evaluating screening services provided in Antenatal clients in health facilities of Lundazi district, Zambia.

Health facilities are expected to provide quality Antenatal care to pregnant mothers. In this study, quality of care means ability of a health facility to provide service according to set standards by Ministry of health as adopted from WHO - 2016. It means a health facility among other components, should have adequate stocks of testing commodities. Laboratory tests are important for improving the health of the mother and the baby through early detection and treatment of ailments. This study found that ANC services provided in Lundazi district-Zambia was inadequate as essential medical equipment-sphygmomanometer, weighing scales and doppler were either unavailable or dysfunctional. A similar study by Libingi et al (2019) in Livingstone- Zambia revealed that 58.4% of the respondents reported that ANC equipment were inadequate.

A study done in Nigeria by Yusuf and Saidu (2015) and Lama et al., (2020), reported that the increase in maternal mortality is attributed to inadequate equipment used for screening in antenatal clinics.

The present study found all the five health facilities without Multistix to test urine for proteins, ketones and sugar. Multistix were reported to have been out of stock since January 2018. Obviously, the assessed health facilities could not carry out essential investigations for early detection and management of urinary tract infections, diabetes mellitus and hypertensive disorders of pregnancy before potentially fatal eclamptic fits develop. In the same vein, World Health Organization (2016) points out that availability of Multistix and other essential commodities promotes the early detection and treatment of complications. These findings are similar to the results of a national study conducted in Zambia by Kyei et al., (2012) which revealed that ‘urine protein testing essential for detecting hypertensive complications was performed by less than a quarter of ANC facilities. Additional studies by Phommachanh et

al., (2019); katemba et al., (2018); Ejigu et al., (2013) reported that urine testing was not performed on majority ANC clients. The Non-availability of Multistix therefore, defeats the achievement of quality of antenatal care.

Ricci (2013); Pillitteri (2010); Fraser and Cooper, (2009) observed that pregnancy is characterized by an increase in plasma volume (40-50%) which results in haemodilution and a decrease in hemoglobin concentration.

The same scholars add that pregnant women should have a mandatory haemoglobin test because not only is the haemoglobin level reduced by the physiology of pregnancy, malaria also contributes to anaemia. This study’s findings showed that four out of five health facilities had functional heamacue (Figure 2). These facilities were carrying out Haemoglobin tests on antenatal mothers. The health facility that was unable to conduct haemoglobin tests had a non-functional heamacue due to lack of batteries. However, all the clinics under this study could not test pregnant women for blood grouping, ABO and Rhesus factor (Figure 2). In a similar study by Miltenburg et al. (2017) in Tanzania noted that in 2014 and 2015, no clinic was able to test for haemoglobin level or blood grouping.

Katemba et al., (2018) in Zambia also observed that ANC components not sufficiently provided was blood and urine testing. A similar study by Mchenga et al., (2019) found that only 47% of women received blood tests in Malawi. Lack of such investigations would put pregnant women at risk as pregnancy complications would be missed.

Zambia being an endemic area for malaria should have all pregnant mothers tested for malaria at booking and when haemoglobin level is less than 11 grams per decilitre (WHO, 2016). ANC clients should also be tested for malaria once fever and general body malaise is reported (WHO, 2016). This study’s findings showed that except for one health facility the remaining four facilities tested antenatal mothers for malaria (figure 2).

The health facility that could not test pregnant mothers for malaria did not have Rapid Diagnostic Testing Kits (RDTs) in stock.

Haruna et al. (2019) in Ghana observed that lack of laboratory facilities makes it difficult to diagnose pregnancy complications and other risks timorously.

The reason why Lungu et al., (2011) in Malawi observed that the successful implementation of ANC requires investing in medical supplies and equipments. In under-resourced health systems, this can pose a challenge and affect the wellbeing of the mother and growing fetus. It is imperative therefore, that those with high risk conditions be referred to the next level of care once abnormalities are identified.

For HIV Testing the study found one out of five health facilities had expired HIV Test kits therefore could not test pregnant women for HIV. In a similar study by Miltenburg et al. (2017) in Tanzania noted that in 2014 and 2015, no clinic was able to test for syphilis though few had the ability to test for malaria and HIV. The same scholars noted that there were certain periods in the year where HIV tests were done frequently. Lungu et al., found that there were shortages of essential laboratory supplies at one urban clinic in Malawi, which made it difficult to conduct the essential laboratory tests. Nyarko et al., (2006) reported similar findings in Ghana. This level of access is disappointingly low given that blood sample testing is one of the essential factors in reducing HIV transmission from the mother to the unborn child.

This study found that despite health facilities claiming to have a tape measure when the researcher probed for it, facility staff could literally search for the tape measure high and low elsewhere outside the room where antenatal examinations were done from.

Clearly, it meant that though the tape measure was available, health facility staffs were not using the tape measure consistently. The World Health Organization insists on consistent use of a tape measure for foetal growth assessment to detect intrauterine growth restriction and oligohydramnios when the height of fundus is smaller than the gestational age, and detection of potential multiple pregnancy, macrosomia and polyhydramnios when the symphysis fundal height is 4cm higher the gestational age in weeks (WHO, 2018; Ricci, 2013).

The World Health Organization insists on the use of accurate low-cost methods for detecting abnormal growth because ultrasound, the most accurate screening tool, is resource-intensive and not widely available in Low and Medium Cost Income Countries (Lama et al., (2020).

Blood pressure check assists in early detection of hypertensive disorders of pregnancy. In this study, despite four (4) of the facilities having functional Sphygmomanometer (table 1), only 4 (80%) of the facilities had their clients' blood pressure checked. This is because the Sphygmomanometer at one (1) facility stopped functioning while the data was being collected due to old batteries (figure 1).

In a similar study in Bangladesh by Mansur et al., (2014) found that among 13 centres under their study, 2 (15.4%) of the centres had no Blood pressure machine while 69.2% had no stethoscopes.

Another study by Ejigu et al., (2013) in Ethiopia found that all health facilities had functional stethoscope but the sphygmomanometer was unavailable. Similar studies in Tanzania, Nepal and Ghana found that Blood pressure was measured in only 2 out of 42 observations at the hospital (Nyarko et al., 2006; Joshi et al., 2014; Miltenburg et al. 2017). This was attributed to the fact that not all medical attendants were aware on how to use the machine; other health workers reported malfunctioning of the machines (Miltenburg et al. 2017). This picture is really unfortunate as hypertensive disorders in pregnancy which is ranked by (WHO) as one of the diseases leading to maternal deaths is not diagnosed and timely treatment not given.

Conclusion

In conclusion, this study found that all the health facilities under study could not weigh the pregnant women. Urine testing was the least received component of ANC as there were no Multistix in all the clinics under study. The health facilities could not screen the ANC users' blood group, ABO or Rhesus factor. However, only one (1) facility could not screen the Blood for Human Immune Virus (HIV) and Malaria since reagents were out of stock. Another clinic could not check the clients' haemoglobin level as the Hamacue machine was dysfunctional.

Routine ultrasound as recommended by WHO (2016) was not done in all the five (5) facilities under study. This study also found that only one (1) clinic had a tape for measuring the Height of fundus. Efforts targeted at the provision of quality ANC care and reducing maternal mortality can only be successful if supplies and

equipments used for screening medical conditions are available.

health – District health office to make sure that supplies and equipment’s which would easy the screening of ANC clients/users are available and serviced.

Recommendation

The study recommends that steps should be taken by the health facility personnel and Ministry of

Figures and Tables

Table 1. Availability and function ability of equipment and other supplies for Antenatal care provision (n = 5 facilities)

ANC Equipment		Availability		Percent (%)
		Functional	Not Functional	
Weighing Scale	Yes		1	20%
	No		4	80%
Fetalscope	Yes	5		100%
	No			
Doppler	Yes	-	-	-
	No	5		100%
Tape measure	Yes	1		20%
	No	4		80%
Sphygmomanometer	Yes	4	1	100%
	No			
Multistix	Yes	-	-	-
	No	5		100%

Table 1 above shows majority, 4 (80%) of the health centers with non-functional weighing scales. All, 5(100%) health centers without multistix and hand Doppler. 4(80%) with no tape measures.

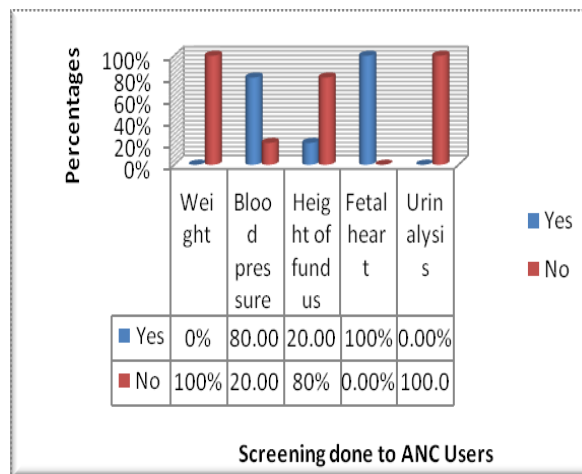


Figure 1. Screening done during ANC visits (n =60)

Figure 1 shows that all (10%) of the clients did not have their urine tested and weight checked. Height of fundus was not measured in the majority, 80% of the clients. Blood pressure was measured in 80% of the clients.

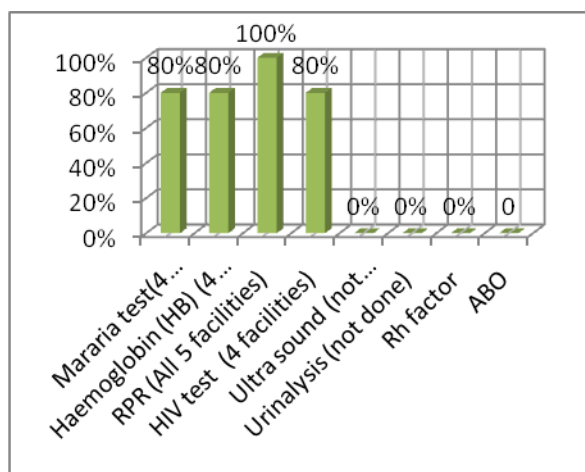


Figure 2. Percentage with ANC screening services

(n =5)

Figure 2 above shows that all (100%) health facilities could not screen urine for glucose, proteins and ketones; blood for grouping, and Rhesus factor. All the health centers could not do ultra sound. However, Blood was screened for syphilis in all five health centers.

Authors' Contribution

PM was responsible for the study conception and design, analysis and drafting the manuscript. Both JT and PM participated in data collection. JT gave guidance on the analysis of qualitative data. Both authors read and approved the final Manuscript.

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