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QUALITY IMPROVEMENT PROJECT ON ENHANCING DOMICILIARY HEALTHCARE: PROMOTING THE USE OF PORTABLE DOPPLER MACHINES TO DETECT EARLY FETAL ABNORMALITIES AND MINIMIZE PERINATAL MORBIDITIES AND MORTALITIES

Wattuhewa D Y [1]

[1]*Acting Consultant Obstetrician and Gynaecologyst, Base Hospital Muthur Sri Lanka*

Corresponding Author: *hewamanna196910@gmail.com*

INTRODUCTION

Perinatal care is a critical aspect of maternal and child health, with a primary focus on ensuring the well-being of both the mother and the developing fetus. One significant indicator of fetal health is the assessment of fetal movements, which serves as a subjective measure reported by the mother. Fetal movement abnormalities encompass a spectrum of conditions, including fetal tachycardia, bradycardia, and reduced baseline variability in cardiotocography (CTG). While reduced fetal movements may often be attributed to non-pathological factors such as maternal stress, activity levels, and sleeping patterns, it becomes imperative to distinguish instances where such reductions signify underlying fetal abnormalities.

Reduced fetal movements, as perceived by the mother, may not solely stem from fetal pathologies but can also result from external factors such as pharmaceuticals, smoking, alcoholism, and maternal stress. However, during the last trimester, these reductions may manifest as a significant concern, especially when associated with true pathological conditions such as intrauterine growth restriction (IUGR), placental abruption, or a low amniotic fluid index. Timely and accurate identification of these conditions is crucial, as prompt interventions can effectively mitigate perinatal morbidities and mortalities.

Objectives

To assess the impact of promoting the use of portable Doppler machines among domiciliary healthcare workers in detecting early fetal abnormalities, specifically focusing on fetal movement abnormalities such as tachycardia, bradycardia, and reduced baseline variability in CTG, to minimize perinatal morbidities and mortalities.

Methodology

To enhance the quality of perinatal care within Sri Lanka's established domiciliary care delivery system, we propose the introduction of handheld Doppler machines to field midwives at the community level. Currently, fetal heart rate assessments are predominantly conducted using the Pinnard stethoscope, a manual and subjective method that relies on placing the instrument on the mother's abdomen, specifically the anterior shoulder of the fetus, and listening for fetal heart sounds.

The integration of handheld Doppler machines represents a significant advancement in fetal monitoring technology, offering a more objective and precise means of assessing fetal well-being. This intervention aligns with the existing domiciliary care framework, which operates under the coordination of Public Health Midwives (PMH). In this system, antenatal mothers receive monthly visits, and during the last trimester, visits occur every other week.

Intervention

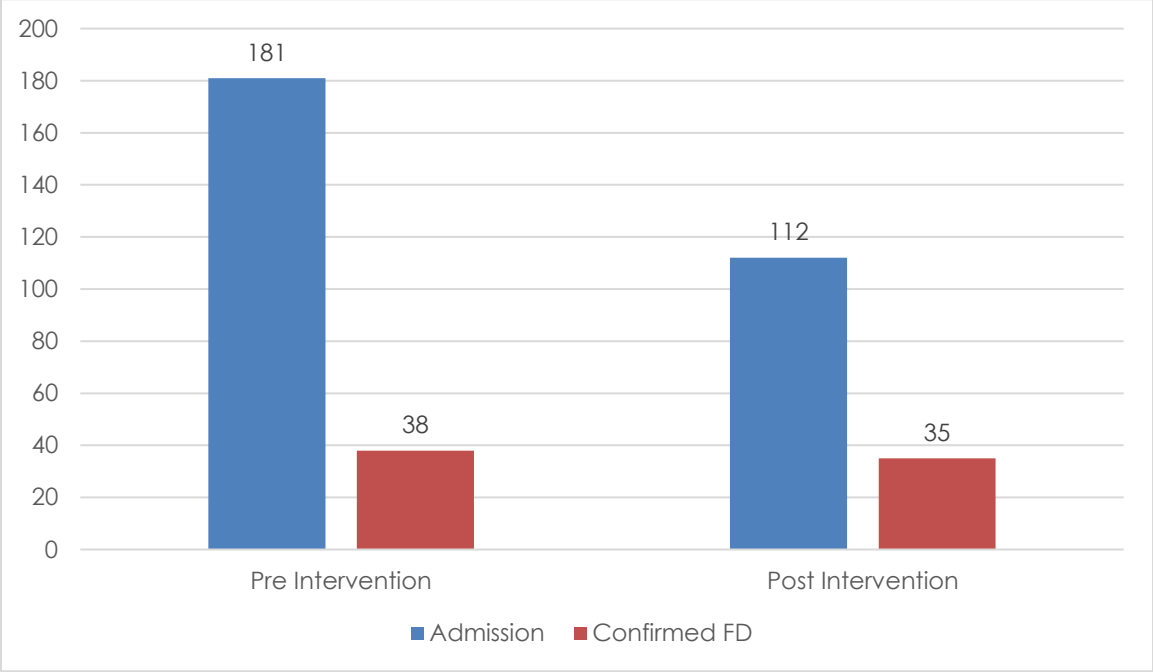
In the Muthur healthcare delivery division, a targeted intervention will be implemented to enhance the skills and capabilities of midwives in fetal monitoring using handheld Doppler machines. The intervention will involve the following key components:

Conduct a comprehensive training program for all midwives in the Muthur healthcare delivery division. The training will focus on the proper usage of handheld Doppler machines, interpretation of fetal heart rate readings, and guidelines for determining when to reassure and when to refer for further evaluation. Emphasis will be placed on building the midwives' confidence and proficiency in integrating Doppler technology into their routine practice.

Equip each midwife with their own handheld Doppler machine, ensuring accessibility and continuity throughout the intervention period. This approach encourages ownership and familiarity, facilitating a smoother transition to the new technology.

The intervention will span three months, during which midwives will actively incorporate handheld Doppler machines into their regular domiciliary visits. Throughout the three months, midwives will systematically document and report their findings using handheld Doppler machines. This includes instances of normal fetal heart rates, as well as cases where abnormalities are detected. The collected data will be compiled and analyzed to assess the impact of the intervention.

Pre-intervention and post intervention analysis



According to the pre intervention evaluation, 181 hospital admissions due to lack of foetal movements among mothers in last trimester. Out of those admissions 20.9%(n=38) confirmed as patients with CTG abnormalities. After the intervention 112 admissions from last trimester pregnant women, out of that 31.2%(n=35) confirmed as patient with CTG abnormalities.

The outcomes of the audit reveal a notable trend in hospital admissions due to pathological conditions detected during the intervention period. Specifically, there is a discernible increase in hospital admissions attributed to true pathological fetal abnormalities compared to the previous admission records.

Discussion

In the context of a country like Sri Lanka, where economic challenges and low-income populations prevail, the reduction of unnecessary admissions carries considerable importance. The availability of free healthcare services provided by the government is a vital resource, and any measures to reduce out-of-pocket expenses for the population align with broader healthcare and economic goals.

By effectively utilizing handheld Doppler machines as a screening method during routine domiciliary visits, midwives can identify genuine pathological conditions early in the antenatal period. This proactive approach enables timely referrals and interventions,

potentially circumventing the need for unnecessary hospital admissions based on false alarms or non-pathological conditions.

The economic implications of reducing unnecessary admissions are substantial, contributing to the efficient management of government health expenditures. By employing handheld Doppler machines as a cost-effective screening tool, the healthcare system stands to benefit from improved resource allocation. The optimization of government health expenditure can lead to enhanced sustainability and accessibility of healthcare services for the population, especially in low-income settings.

The positive impact of handheld Doppler machines on early recognition of true pathological conditions and subsequent early interventions is a crucial aspect of this audit's findings. By integrating these devices into routine domiciliary visits, midwives have demonstrated an enhanced ability to identify and address potential complications during the antenatal period. The early recognition of true pathological conditions is particularly noteworthy, as it enables timely interventions that can mitigate the severity of complications and improve overall perinatal outcomes. The handheld Doppler machines have proven instrumental in detecting abnormalities such as cord rounds, placental abnormalities, and growth irregularities, which might otherwise go unnoticed until later stages of pregnancy or delivery. In a setting where access to advanced monitoring tools like cardiotocography (CTG) is limited due to financial constraints, the handheld Doppler emerges as a valuable alternative, providing an affordable and effective means of fetal assessment.

One significant advantage highlighted in the results is the successful detection of abnormalities without the necessity for CTG monitoring, which is often cost-prohibitive for many mothers in Sri Lanka. The handheld Doppler machines, being more accessible and affordable, offer a practical solution for early detection and intervention. This not only reduces the economic burden on expectant mothers but also aligns with the principles of equity in healthcare, ensuring that essential monitoring tools are accessible to all, irrespective of financial constraints.

The success of this intervention is further amplified by the existing domiciliary healthcare system in Sri Lanka. The established infrastructure facilitates the seamless integration of handheld Doppler machines into routine antenatal care visits. This adaptability, coupled with the commitment and expertise of midwives, has played a pivotal role in the intervention's success.

Conclusion

As we reflect on the outcomes of this intervention, it becomes evident that steps should be taken to extend the benefits beyond the current scope. A proactive measure to provide all midwives across Sri Lanka with handheld Doppler machines, accompanied by comprehensive training, emerges as a crucial initiative. By equipping midwives with handheld Doppler machines and imparting appropriate training, we can establish a uniform standard of care that is not only effective but also cost-effective. This initiative aligns with the broader goal of optimizing maternal and fetal health outcomes while simultaneously addressing economic considerations in a country like Sri Lanka. The cost-effectiveness of this approach lies not only in the affordability of the technology itself but also in the potential reduction of unnecessary interventions, hospital admissions, and the associated economic burden on both the healthcare system and expectant mothers. Also paves the way for sustained improvements in maternal and fetal health outcomes across the nation.

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