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Short Communication

Rationalising use of Cardiotocography (CTG) in India for evidence based decision making during labour

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ABSTRACT

Out of the 2.62 million stillbirths globally in 2015, India unacceptably tops the list with a contribution of about 592,000 stillbirths and Foetal monitoring during labour is a crucial practice for identifying potential foetal distress and improving perinatal outcomes. Antepartum and intrapartum Cardiotocography (CTG) is the first line investigation for foetal assessment and it provides details about foetal heart rate such as baseline variability, accelerations and deceleration, however evidence suggests, CTG test is a simple, non-invasive screening test, not a diagnostic tool and routine CTG is not recommended for low risk pregnancies as it can increase the risk of caesarean section without evidence of benefit. There is a need to evaluate the use of CTG in public health settings in India, assess the decision making for interventions by the health care providers. Based on the evaluation, there is a need to develop standard treatment workflow or standard operating procedures (SOPs) to optimize the CTG use in Indian public health system context. Further research is needed for evaluation of newer portable smart CTG machines for its clinical and cost effectiveness to predict foetal distress.

1. Introduction

Childbirth is a normal physiological process; however, in low and middle-income countries (LMICs) there is an increased risk of maternal and neonatal mortality at the time of birth, due to preventable causes. Over one-third of maternal deaths and life-threatening conditions, approximately half of all stillbirths and a quarter of neonatal deaths result from complications during labor and childbirth. Despite the advancements in perinatal care in past decades, perinatal asphyxia remains a serious problem leading to significant perinatal morbidity and mortality and can lead to stillbirth. Out of the 2.62 million stillbirths globally in 2015, India unacceptably tops the list with a contribution of about 592,000 stillbirths.[1] According to the Inter-Agency Group report, an estimated 340 600 stillbirths occurred in the Indian population of 1.4 billion in 2019, the largest numbers globally, translating into a rate of 13.9 stillbirths per 1000 births.[2]

Foetal monitoring during labour is a crucial practice for identifying potential foetal distress and improving perinatal outcomes. The main aim of intrapartum foetal monitoring is to identify foetus that are being inadequately oxygenated, enabling appropriate action before the occurrence of distress. Cardiotocography provides details about foetal heart rate such as baseline variability, accelerations and deceleration.[3] and is the most common method used by clinicians for foetal monitoring and uterine contractions to prevent neurological injury.[4] The use of antepartum and intrapartum cardiotocography (CTG) has increased over the last 15 years and today CTG is the first line investigation for ante and intra partum foetal assessment. In a state like

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Maharashtra significant portion of public health facilities have CTG machines ranging from 53% at sub district hospital; 80% in women hospital, and 6.4% at PHC level.[5]

Evidence suggests the admission CTG should not be used for women who are low risk on admission during labour because there is a high probability that admission CTG increases the caesarean section rate by approximately 20%.[6] Both developed and developing countries contribute equally to the rising caesarean section prevalence (27.2% to 20.9%).[7] But the highest average annual rate of caesarean section is observed in the regions of Asia (6.4%) and in India, the proportion of caesarean deliveries have dramatically increased to 17% (2015-16) and 21.5% (2019-21) from just 3% in 1992-93.[7] A systematic review concluded that at the population level, caesarean rates higher than 10% are not associated with reductions in maternal and new-born mortality rates.[8]

On one hand CTG is a critical tool in identifying foetal distress to safeguard both mother and baby however, it's wide spread utility has also been linked with increase in caesarean section even in cases where there is no clear evidence of benefit.[6] Cochrane review suggests that women should be informed that admission CTG is likely associated with an increase in the incidence of caesarean section.[6] Until date, there is no clear guideline or standard operating procedures (SOPs) nor any standard treatment workflow for usage of CTG in the public health system in India. Also there is no evaluation of its use in evidence based decision making for surgical intervention during labour.

WHO Labour Guideline 2020 states routine cardiotocography is not recommended for the assessment of foetal well-being on labour admission in healthy pregnant women presenting in spontaneous labour.[9] As per South Australian Perinatal Practice Guideline, Continuous CTG is recommended when risk factors for foetal compromise are detected during pregnancy, at the onset of labour, or at any time during labour and Intermittent, auscultation is equally as effective as continuous CTG monitoring for low-risk women in labour.[10] FIGO (International Federation of Gynaecology and Obstetrics) consensus guidelines on intrapartum fetal monitoring have also recommended that CTG should not be used for women who are at low risk during labour, however continuous CTG monitoring should be considered in all situations where there is a high risk of foetal hypoxia/acidosis.[11]

A study done by Palomäki et,al.,[12] found, Inter-observer variability in interpretation of abnormal CTG readings and recommendations for intervention is relatively wide. These challenges are being mitigated through newer wireless, portable and smart CTG machines. However, their clinical effectiveness as well as cost effectiveness needs to be evaluated before recommending its use in public health system in India.

1.1. Key viewpoint

CTG may help in identifying foetuses at risk during labour, but it may also lead to more Caesarean sections (LSCS) in high-risk pregnancies.[13] Given the increasing caesarean section rates and high burden of still births and birth asphyxia in India, there is an urgent need to optimise rationale use of CTG test which is a simple, non-invasive screening test, though not a diagnostic tool.

There is a need to standardise its use in terms of where should these devices be placed, its indication for use, frequency of use during labour. This should be coupled with rational decision making for intervention based on a comprehensive set of clinical assessments and CTG report.

Recent advancements in CTG technology, which have digital recording; are compatible for use for in telemedicine, portable and smart, provide benefit to patients in terms of comfort and data accessibility; but available evidence shows low sensitivity (60%) and high specificity (94%). This requires further investigation to compare these newer machines with conventional CTG devices in terms of predicting and monitoring foetal distress during labour.[14,15]

2. Conclusion

The authors conclude that although, CTG is a valuable tool for identifying foetal distress but it can also lead to increased risk of caesarean section without evidence of benefit. To optimize the use of CTG there should be a clear SOP/Guideline to indicate at what level of public health facility it should be available and standard treatment workflow must be developed to provide clear indications for its use, frequency of its use and making a decision for intervention during labour. Current practices of how CTG machines are used in public health settings needs to be assessed and further research is needed to evaluate newer portable smart CTG machines for its clinical and cost effectiveness in predicting foetal distress.

3. Conflict of Interest

None.

4. Source of Funding

None.

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