Effect of Midwife Administration of Hyoscine-Butylbromide in Preventing Prolonged Labour among Primigravidal Women in Ogbomoso Oyo-State, Nigeria

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Abstract

Prolonged labour increases risk of maternal fatigue, postpartum haemorrhage, sepsis, and fetal distress. Therefore, proactive midwife intervention aiming at preventing prolonged labour actively by administering hyoscine-butylbromide (buscopan injection) an antispasmodic agent at the active phase of labour is of great importance for women and most importantly primigravidal woman in labour who is at higher risk of prolonged labour. This study investigates effect of midwife administration of hyoscine-butylbromide in preventing prolonged labour among primigravidal women in selected health facilities in Ogbomosho, Oyo State, Nigeria. A double blind quasi experimental research design was adopted in this study involving sixty (60) primigravidal women in labour. Thirty (30) of which were the experimental group and 30 were control group. A self-designed checklist was used to assess the duration of labour stages and outcomes; while midwife is providing care to the woman in labour. Inferential statistics such as Pearson correlation was used to test the hypotheses at a significance level of 0.05. The study revealed a significant difference in the administration of hyoscine-butylbromide on the duration of labour between the experimental and control groups P-value 0.023. However, there was no significant difference in labour outcomes between groups, P- Value 0.692. It is therefore recommended that Hyoscine-butylbromide should be included among drugs administered by midwives, as it has no adverse effects on the mother or fetus and does not significantly affect the outcome of labour. Thus, hyoscine-butylbromide should be considered a recommendation for primigravidal women during the active phase of labour to proactively prevent prolonged labour.

Keywords: Administration, Hyoscine-Butlybromide, Prolong Labour, Primigravidal Women, Labour
Word Count: 250 words

Teaser Key Message

For a midwife, a typical labour course, safe delivery, and neonatal wellness are central concerns. However, the global issue of maternal morbidity and mortality, often influenced by protracted labour, is a significant concern that must be addressed.

Primigravida women are at higher risk of prolonged labour. It is essential that we research and develop proactive measures to prevent prolonged labour and its complications, both for the mother and the fetus. Our involvement in this research is, therefore, crucial.

Key Finding

- Proactive intervention of midwives in primiparous (first-time) women, midwives will prevent complications from prolonged labor, rather than waiting for a diagnosis of rigid cervix or prolonged labor.
- Hyoscine-butylbromide an effective antispamodic drug with history of being used unofficially or off record by ancient midwives to aid cervical dilation when a rigid cervix is suspected or diagnosed, it has been used unofficially or off record.
- Hyoscine-butylbromide was found to reduce labour length with no adverse effect on the mother or the baby, it should therefore of a great benefit to a primiparous woman in labour who are at high risk of prolonged labour and its complication.
- Hyoscine-butylbromide should be officially permitted for use by midwives in managing first-time labor, particularly in cases where prolonged labor is a risk.

Key Implication

- The first stage of labor is the longest and can predict whether labour will be prolonged. Prolonged labor often leads to complications.
- Prolonged labour increases the risk of maternal exhaustion, postpartum hemorrhage, sepsis, fetal distress and NICU admission which could result in maternal and neonatal morbidity and mortality

- If Hyoscine-butylbromide aids cervical dilation with no adverse effect, hence the purpose of this research to verify its efficacy with the aim to prevent lengthy labour period in primigravidal women who are at high risk of prolonged labour. If used proactively by midwives during the active phase of labour.
- If prolonged labour is successfully prevented especially in primigravidal women, it will therefore prevent associated complications of prolonged labour and spares primiperous women from unnecessary long period of pain and stress.

Background

Prolonged labour is a complication of labour common in primigravidal women, which may disrupt a normal labour process, making a significant indication for instrumental delivery. Increased maternal and neonatal risk of fetal distress, neonatal hypoxia, uterine rupture, and postpartum hemorrhage may also increase the risk of maternal pelvic floor and genital trauma. (Nystedt & Hildingsson. (2014), Prolonged labour is a labour dystocia. Nystedt, A., & Hildingsson, I. (2014). Diverse definitions of prolonged labour and its consequences, with sometimes subsequent inappropriate treatment, are increasing in recent nursing studies. Primigravidal women are known to experience a longer length of labour period as compared to multiparous women; a substantial number or greater percentage of primiparous women end up having a disrupted average labour progress, prolonged labour, which predispose them and the neonates to health risks and death, thereby increasing maternal morbidity and mortality rate. Also, the longer the length or period of the labour process, the longer the exposure to labour pain. Brenne-Fehn et al. (2020) state that poor labour progress is associated with increased rates of complications, such as instrumental delivery, Cesarean Section (CS) and postpartum hemorrhage. For some women, a traumatic birth experience leads to post-traumatic stress disorder, as a poor birth experience can have long-term effects on the future health of the woman and her family and thereby result in dissatisfaction with the birth experience. According to the World Health Organization's (WHO) report of 2023, a dissatisfied birth experience can affect the woman's emotional well-being and even affect her desire to conceive again. Malaika et al. (2020) also note that about 800 women die every day from

preventable causes that are related to pregnancy and childbirth. Also, between 2000 and 2020, the global maternal mortality rate (MMR-number of maternal deaths per 100,000 live births) fell by about 34%.as observed by Li et al. (2022). Bauserman et al., however, conclude that almost 95% of all maternal deaths in 2020 occurred in low-middle-income countries. Therefore, care provided by qualified health professionals before, during and after childbirth can save the lives of women and newborns. The WHO Reports of 2022 also remark that Nigeria accounts for over 34 percent of global maternal deaths. In Nigeria, the lifetime risk of dying during pregnancy, childbirth, postpartum or after an abortion for a Nigerian woman is 1 in 22, compared to 1 in 4900 in developed countries. Thus, implementing a preventive measure for prolonged labour will reduce the percentage of maternal death and promote maternal and fetal well-being. One of the leading causes of prolonged labour in primigravidal women is cervical dystocia. A Primigravidal woman is a first-timer pregnant woman in labour. Though medically expected, this should be unavoidably avoided or prevented proactively when all other causes of prolonged labour (malposition, malpresentation, poor contraction) are ruled out. Hyoscine-butylbromide is an antispasmodic drug which has been found by various researchers to affect the cervix by increasing the rate of cervical dilation, which invariably will reduce the duration of labour (Imaralu et al. 2017), thereby preventing the risk of prolonged labour in primigravida women, and its other complications of protracted labour.

Barau et al. (2018) report that hyoscine-butylbromide has a selective effect on the cervical-uterine plexus at a therapeutic dose. When administered in the face of cervical dilatation, it facilitates cervical dilatation and shortens the duration of labour. In multiple studies, no adverse side effects were observed on uterine contractions, labour progress, or the fetus. Hyoscine-butyl bromide is an antispasmodic drug like atropine but does not cross the blood-brain barrier. Akiseku et al. (2021) note that Hyoscine N-butylbromide has been found to shorten the duration of the first phase of labour with no adverse consequences for the mother or the newborn. In every process of labour, the first stage is the longest compared to the duration of the second and third stage. This is the only stage associated with cervical dilatation and determines the success and outcomes of the other stages of labour. Various studies have assessed the effect of hyoscine-butylbromide on the course of labour. This study, therefore, aims to determine the impact of proactive intervention of

midwife administration of hyoscine-butylbromide to primigravidal women in labour and with termed pregnancy, with a single fetus presenting with the cephalous, who mostly tends to prolonged labour and with its associated complications to the woman and the fetus.

Methodology

A quasi-experimental study was conducted with 60 respondents, primigravidal women who were in labour at the three selected research settings (hospitals) in Ogbomoso, Oyo State, Nigeria. Thirty (30) were randomly but unthinkingly controlled groups, while thirty (30) were in the experimental group. The research study was to find out the effect of hyoscine-butylbromide in preventing prolonged labour among primigravidal women in labour. Thirty (30) research drugs and 30 placebos were prepared by the pharmacist in a 5ml syringe, both having the same volume (3mls) and colourless. The pharmacist numerically labels both as it is being prepared for the study once a primigravidal respondent is available. The research agents are just labelled 1-60 as they are being prepared, while the actual content in each labelled syringe contains the agent of the study (either hyoscine-butylbromide or sterile water), which is blind to the researcher, the investigators and the midwives. The labour progressed as the length of each stage of labour and outcome of labour was monitored by the midwife in charge of the care of the woman in labour. After administering a research agent, it could not be determined if it is the experimental drug or the placebo using a self-prepared checklist as a guide. This checklist is boldly labelled with the number on the syringe of the research agent used. These agents were administered during the active phase of labour (cervical dilatation of >/= 4cm), and data on the labour progress, the length of labour and the outcome of labour are documented on the self-prepare checklist. At the end of the data collection, the pharmacist revealed the content of each research agent and the number of each syringe of the agents to the analysis, revealing which is the experimental agent and which is the control agent. The result was then revealed, showing the difference in the effect of the experimental drug on the cervix, length of labour, the outcome of labour, and whether it has an impact in preventing prolonged labour compared to the control agent of the study.

The total number of participants was sixty (60), including forty-six46 from Ibrahim Taiwo Primary Health Center, nine (9) from Adebayo Alata Primary Health Center, and five (5) from BOWEN University Teaching Hospital.

Inclusion criteria: Primiparous woman with ≥ 37 weeks gestational age, singleton fetus, an intact fetal membrane with the cephalic presentation, already in labour with cervical dilation ≥ 4cm, average body weight, no sign of maternal or fetal distress, having regular uterine contractions.

Exclusion criteria: Multigravida woman, multiple fetus pregnancy, mal-presentation and malposition, previous cervical surgery, women with high blood pressure or pregnancy-induced high blood pressure (BP> 150/90), hypersensitivity to hyoscine and contraindication for vaginal delivery. Pregnancy-induced illnesses were excluded from the study as all the participants signed informed consent forms before they were allowed to participate in the research study.

Analysis

The data collected was analysed using the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics were used to measure averages, percentages, coefficient of variation, and inferential statistics, such as independent sample tests. Before the analysis, the instrument for data collection was edited, i.e., the instrument was checked for omissions, errors, and other mistakes. The coding sheet was prepared using an Excel package to enhance the accuracy of the needed variable before it was imported into SPSS. However, the quality of the data was maintained.

Results

The effect of hyoscine butylbromide on the duration or length of labour during the first, second and third stages of labour was considered with the control and experimental groups in Table 1 below; the average means of the length of labour in the experiment group was less than that of the control group. The mean duration of the first stage of labour (316.5200 minutes), the second stage of labour (21.8800 minutes) and the third Stage of labour

(6.6400 minutes) in the experimental group, while the average means of the length of labour in the control group was 764.8000 in first stage, 25.7600 in second and 7.8400 in third stage of labour. Hyoscine butyl bromide significantly affects the experimental group's duration or length of labour.

Table 1: The Effect of Hyoscine-butyl bromide on the Duration or Length of Labour Among Women in the Experimental and Control Group

DURATION OF LABOUR		Minimum Duration of Labour in minutes	Maximum Duration of Labour in Minutes	Mean Duration of Labour	Standard Deviation
Control Group(placebo)	The first stage of labour	180.00	4500.00	764.8000	882.65
	Second Stage of Labour	6.00	55.00	25.7600	16.16
	Third Stage of Labour	2.00	45.00	7.8400	8.35
Experimental Group (Hyoscine butyl bromide)	The First Stage of Labour	60.00	730.00	316.5200	175.85
	Second Stage of Labour	5.00	62.00	21.8800	14.60
	Third Stage of Labour	3.00	20.00	6.6400	3.56

Source: The Researchers (2024)

The delivery outcomes of both the experimental and control groups are shown in Table 2 below. Under the use of a Placebo (Sterile water) (control group), 90 percent (27) had a vaginal delivery, and 10 percent (3) had a Caesarian section. An average mean Apgar score in one minute was 8 and 9 in five minutes. In the experimental study, 83.3 percent (25) had

a vaginal delivery, and 16.7 percent (5) had a Caesarian Section. The average mean of Apgar's score in one minute was 8 and 9 in five minutes.

On blood loss after delivery, the Control group had a minimum blood loss of 80mls and a maximum blood loss of 269mls, while the experimental group had a minimum blood loss of 70mls and a maximum blood loss of 430mls. The estimated average blood loss in the control group was 165.5mls, while the estimated average in the experimental group was 160.5mls.

Table 2: Outcome of Delivery among the Women in Experimental and Control Group

	Mode of delivery		Number	Percentage
	Control	Vaginal	27	90.0
Mode of delivery		Caesarian section	3	10.0
		Total	30	100
	Experimental	Vaginal	25	83.3
		Caesarian section	5	16.7
		Total	30	100
Baby's Apgar scores		One Minutes	Five Minutes	
Control	Mean	8	9	
Experimental	Mean	8	9	
	Blood lost after delivery(vaginal)			
Estimated Blood loss for Vagina Deliveries	Control	Min.	80	
		Max.	260	
		Mean	165.5	
	Experimental	Min.	70	
		Max.	430	
		Mean	160.5	

Source: The Researchers (2024)

Discussion of Findings

The mean duration of the stages of labour among the primigravidal women in the experimental group in minutes was 316.5200 (first stage), 21.8800 (second stage) and 6.6400 (third stage) making a total of 345.0400 minutes while the mean duration among primigravidal women in the control group in minutes was; 764.8000 (first stage), 25.7600 (second stage) and 7.8400 (third stage) making a total of 798.4000 minutes. The parameters reveal the difference in the duration of labour between primigravidal women in the experimental and the primigravidal women in the control group was 453.3600 minutes.

This study was supported by the findings of Ejikeme et al. (2020), who reported that hyoscine-butylbromide is effective in reducing the first and second stages of labour with no adverse effects on the mother or newborn and does not significantly affect the duration of the third stage of labour, including the mode of delivery. The mean duration of the first phase of labour was found to be shorter in the hyoscine butyl bromide group in both the firstborns (246.6 ± 21.9 vs. 391.8 ± 56.6 min in control; $P<0.001$) and in the Multigravidas (205.9 17.8 vs. 323.8 16.0 min in controls) was significantly shorter; $P<0.001$).

This study finding was confirmed by the conclusions of Ibrahim et al. (2019), which revealed that hyoscine butyl bromide shortened the first phase of labour in primigravidal and multigravida women without adverse maternal and neonatal complications. This reveals that hyoscine butyl-bromide is effective in both primigravidal and multigravida women. The aim of this study was based on primigravidal women only of preventing prolonged labour among primigravidal women who are at risk of prolonged labour.

This study has, therefore, revealed that hyoscine-butylbromide can be used proactively by midwives on primigravidal women to prevent prolonged labour or any form of cervical arrest.

The delivery outcome in this study was measured by considering the mode of delivery, fetal Apgar's score at one and five minutes, estimated blood loss, and post-partum hemorrhage.

This study revealed that 27 of the control group had a vaginal delivery, and 3 had a caesarian section. The indications for instrumental delivery were poor labour progress, maternal high blood pressure and prolonged labour. At the same time, in the experimental group, 25 had a vaginal delivery, and 5 had a caesarian section. The indications for instrumental delivery were Cephalopelvic disproportion, maternal high blood pressure, unprogressive labour and Placenta Previa. It was found that hyoscine-butylbromide prevents prolonged labour, as prolonged labour is one of the indications for instrumental delivery in the control group. Hyoscine-butylbromide does not affect the pelvis makeup or prevent Cephalopelvic disproportion.

This is in contrast with the conclusion of the findings of Meged et al. (2021) that hyoscine-butylbromide lowers the caesarian section rate. This study has it that 3 of the control group had instrumental delivery (caesarian session) while 5 of the experimental group had instrumental (caesarian session); taking notes of the above indications for instrumental delivery (caesarian session), this findings will have is stated that, as much as hyoscine-butylbromide will affect the dilatation of the cervix and labour length, it does not involve a boarder lined pelvis (CPD), placenta Previa or maternal high blood pressure that can predispose the woman to pre-eclampsia or eclampsia and that hyoscine-butylbromide will reduce instrumental delivery in poor labour progress, cervical dystocia or cervical arrest.

This is confirmed in research findings by Elkady et al. (2021) on the effect of hyoscine-butylbromide on the rate of vaginal delivery in cases of secondary arrest of cervical dilatation, and the conclusion was that hyoscine-butylbromide 40 mg is safe and effective in increasing the rate of vaginal delivery in cases of secondary arrest. It is effective in reducing the first and second stages of labour.

Both the experimental group and the control group have no record of postpartum hemorrhage. Therefore, hyoscine-butylbromide does not effect on or causes postpartum hemorrhage. Fetal Apgar's score at one minute and five minutes in the control group and the experimental group was eight at one minute and nine at five minutes; that is, hyoscine-butylbromide does not affect fetal Apgar's score, which is one of the parameters used to measure the outcome of labour. None of the babies born in each group required neonatal resuscitation.

The mean estimated blood loss in the control group is 165.5, while in the experimental group is 160.5; the estimated blood loss for both groups is within the expected range of blood loss after a vaginal delivery. Therefore, hyoscine-butylbromide does not influence labour outcomes when measured based on the estimated blood loss.

Summary

This experimental double-blind study was designed to find out the effect of administration hyoscine-butylbromide by midwife in preventing prolonged labour among primigravidal women in selected health facilities in Ogbomoso. The study was carried out among termed pregnant primigravidal women with single fetus, who are in labour. The study experiments the effectiveness of hyoscine-butylbromide as a proactive management by a midwife to prevent prolonged labour among primigravidal women who are liable to have a prolonged labour and experiences the longest labour length as compare to multiparous women. The study centers were purposely selected being the center than is highly patronized by pregnant women, the target population ware women going into labour for the first time and 60 respondent ware experimented upon, experimental group 30 and the control group 30. The data was collected using a self-designed checklist, which was filled out by the midwife responsible for care of the primigravidal pregnant woman during labour. Four research hypotheses were tested at a significance level of 0.05. Result from the study shows the average age of the respondents was 23 years for the control group and 24 years for the experimental group all respondent has a favorable height. The study reveals there is significant difference in administrating hyoscine-butylbromide on cervical dilation among the experimental and the control group that is hyoscine-butylbromide increases the rate of cervical dilatation in the experimental group when compared to the control group. The study also showed that there was a significant difference in the duration or length of labour when hyoscine-butylbromide was administered to primigravidal women the experimental, there was a reduction in the length of labour at all stages of labour has compared to the primigravidal women in the control group. This study finds no significant difference in birth outcomes between the primigravidal women in experimental and the primigravidal

women in the control groups. And it was observed that hyoscine-butylbromide has no effect on labour out comes, and no adverse effect on maternal and fetal outcomes.

Contribution to Knowledge

The study contributes to the existing body of knowledge about the effectiveness of hyoscine bitylbromide (HBB) during labour but now with the view of preventing prolonged labour among primigravidal women who were at risk of prolonged labour length and its associated risks by providing evidence on its efficacy in shorthening labour length.

For instance, the study by Ibrahim et al. (2019), revealed that hyoscine butyl bromide shortened the first phase of labour in primigravidal and multigravida women without adverse maternal and neonatal complications.

This study also focus on the role of midwives in administering HBB, adds to a practical dimension to the existing literature, highlighting the potential for midwives to proactively and safe intervention in managing labor progression and reduce the incidence of prolonged labor.

Furthermore, the observation that HBB did not affect birth outcomes or maternal and fetal health is consistent with findings from other studies, which have reported no significant differences in neonatal Apgar scores or adverse maternal outcomes between HBB and control groups. This contributes valuable insights to obstetric practice and may inform guidelines for labour management to improve maternal and neonatal outcomes.

Conclusion

This study concluded that prompt administration of hyoscine-butylbromide by a midwife caring for a primigravida woman during the active phase of labour will reduce labour length and patient length of exposure to labour pain and prevent possible prolonged labour. This study also reveals that hyoscine-butylbromide has a prophylactic or a proactive pharmacological intervention in the active management and prevention of prolonged labour and associated complications of protracted labour on the mother and the fetus.

Recommendations

This study, therefore, recommends that:

i. Hyoscine-butylbromide should be recommended for every primigravidal woman during the active phase of labour to prevent prolonged labour.
ii. Hyoscine-butylbromide should be included among drugs on records to be administered by midwives, as it has no adverse effects on the mother or fetus and does not significantly affect the outcome of labour.
iii. Midwives globally should be sensitized to the effect of Hyoscine-buthybromide on reducing labour (pain) length in women during the active stage of labour, especially in primigravida women who are at high risk of prolonged labour and its associated complications.

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