EFFECTIVENESS OF HYOSCINE BUTYL BROMIDE IN SHORTENING THE FIRST STAGE OF LABOUR – CASE SERIES AND REVIEW OF LITERATURE

Akintan AL,[1] Oluwasola TAO[2]

[1]Mother and Child Hospital, Akure, Ondo State, Nigeria.
[2]Department of Obstetrics and Gynaecology, University College Hospital, Ibadan and College of Medicine, University of Ibadan, Ibadan, Nigeria.

ABSTRACT

Background: Prolonged labour from cervical dystocia or stasis is one of the common indications for caesarean delivery. Hyoscine N-butyl bromide (HBB), an anticholinergic and antispasmodic drug, has been found effective in shortening the first stage of labour with no adverse effects on feto-maternal outcomes.

Case presentations: We present a series of 3 cases with apparent clinical evidence of prolonged labour but which later progressed to achieve vaginal delivery following an injection of HBB.

Discussion: Relevant literatures explored revealed the clinical relevance and potential benefits of reviewing the use of HBB in our environment.

Keywords: First stage, HBB, Hyoscine N-butyl bromide, Prolonged labour

INTRODUCTION

The process of labour puts great strain on the mother and her foetus with prolonged labour being associated with several maternal and fetal complications. However, introduction of active management of labour has contributed to reduction in the incidence of prolonged labour though some patients still have episodes of labour dysfunction from cervical dystocia often leading to caesarean delivery. Shortening of labour duration would thereforeminimize maternal and fetal morbidity and mortality.

Several spasmolytics have been tried with varied results.[1,2]Atropine easily crosses the blood brain barrier while drovaterine is less effective when compared with hyoscine.[3]However, hyoscine butyl bromide (HBB) has been reported to effectively shorten the length of the first stage of labour by increasing the rate of cervical dilatation. Parturients who had hyoscine in labour also reported significant pain relief and there has been no associated risk or adverse effects to their babies.[1-4] Routine use of HBB is absent from our protocol despite the potential advantage of significant reduction in the risk of prolonged labour.

Potential bene? ts of reduced ? rst stage time include a reduction in the incidence of chorioamnionitis, neonatal sepsis, and puerperal sepsis, all of which are increased in women with prolonged labour. A reduced need for repeat doses of opioid analgesia, which is associated with neonatal respiratory depression, is also a major bene? t of a shorter labour process. This is particularly true in regions with limiteduse of epidural analgesia and opioid

Corresponding author: Dr Timothy A.O Oluwasola
Department of Obstetrics and Gynaecology,
College of Medicine, University of Ibadan
sesanoluwasola@yahoo.com;

medications are used more frequently. It is believed that any intervention which can safely reduce the amount of time spent in the painful process of parturition will be greatly appreciated by our women.

CASE PRESENTATIONS: The following cases are presented to illustrate this discussion.

Case 1: Mrs CA is a 28years old primigravida who presented in our facility with an 8-hour history of spontaneous onset of labour pains and 6-hour history of spontaneous rupture of foetal membranes. Clinical examination confirmed full cervical effacement, cervical dilatation of 5cm and occurrence of 3 regular, strong uterine contractions within 10minutes. The baby's lie was longitudinal and presentation was cephalic.

She was allowed to progress in labour but a review in 4 hours revealed ineffective uterine contractions for which an augmentation of labour with oxytocin was commenced. A further review 2 hours later confirmed that despite good, adequate uterine contractions, the cervical dilation was 6cm (0.5cm/hour). She had an intravenous hyoscine 40mg and labour was allowed to continue. She became fully dilated 2hrs later and had a spontaneous vaginal delivery of a live female neonate with birth weight of 3.2kg and APGAR score of 8 at one minute and 9 at 5minutes of life. Both mother and baby had no complication and were discharged home the following day. Post natal visit at 6 weeks was essentially as expected and the mother was referred to the family planning clinic while the baby was referred to the infant welfare clinic.

Case 2: Mrs AF is a 25yearsold primiparouslady admitted for induction of labour on account of postdatism.She had effective cervical ripening with intracervical catheter. She was commenced on oxytocin induction when the cervix was fully effaced and cervical dilatation was 4cm. The labour was monitored with the aid of a partograph. A review 4hours after commencement of oxytocin showed that her cervical dilatation remained 4cm despite regular, adequate uterine contractions. She had 40mg ofHBBintravenously and labour was allowed to progress. Twohours later, she achieved cervical dilatation of 7cm and in another 2hours, she was fully dilated.She eventually had an uneventful vaginal delivery of a live female neonate with birth weight of 3.5kg and APGAR scores of 8 at one minute and 10 at 5 minutes of life. Both mother and baby had no complication and were discharged home the following day. Post natal visit at 6 weeks was essentially as expected and the mother was referred to the family planning clinic while the baby was referred to the infant welfare clinic.

Case 3: Mrs AC is an unbooked 21 years-old primigravida admitted in active phase of labour. Cervical dilatation on admission was 4cm but uterine contractions were inadequate. Oxytocin augmentation of labour was commenced and a review after 4 hours revealed a cervical dilatation of 5cm despite regular strong uterine contractions. She was given intravenous hyoscine bromide 40mg slowly with the plan to observe for 2 more hours while making arrangement for possible emergency caesarean delivery. At this second review, she had progressed to cervical dilatation of 8cm and subsequently achieved vaginal delivery an hour later. Baby weighed 3.2kg at birth and has APGAR scores of 8 at the first minute of life and 10 at five minutes. Immediate postpartum period was uneventful.

DISCUSSION

The contractility of the myometrium during pregnancy is usually diminished to accommodate and protect the growing products of conception with the cervix forming a tight sphincter to ensure the integrity of pregnancy. Close to term, myometrial

activity increases and the cervix undergoes biochemical changescalled cervical maturation and ripening thereby paving way for cervical dilatation. However, the subject of cervical dilatation and progress of labour has puzzled obstetricians for a long time, with prolonged labour having implications for both the mother and the foetus. Guided acceleration of labour process is considered to be an important factor in reducing maternal morbidity as well as the neonatal complications.

For active management of labour, prospective detection of departure from normal progress is very important, and should be automatically managed by augmenting the powers to accelerate progress, because this was the only variable open to manipulation by the clinician. Apart from uterine contraction, cervical dilatation is an important factor which determines the duration of labour. Smooth muscle relaxants inhibit impulses, in form of spasms, that impair effective cervical dilatation and various agents have been used to combat cervical muscle spasm. Antispasmodics, such as Hyoscine Butyl Bromide(HBB) – a quaternary ammonium derivative,inhibit cholinergic transmission in the abdominal and pelvic parasympathetic ganglia, with consequent relief of spasm in the smooth muscles of gastrointestinal, biliary, urinary tract and female genital organs, especially the cervico-uterine plexus thus aiding cervical dilatation and can therefore be used for enhancing cervical ripening and shortening stages of labour.

HBB, in form of Buscopan®, has been found useful in shortening the duration of labour in several studies[5-8]. Whereas its analgesic properties are probably negligible in the context of labour, its value lies in the reduced time spent in the ?rst stage, and consequently the reduced overall time spent in pain by the parturient. Literature review revealedvery few studies relating to HBB and its use in labour with most of them confirming its effectiveness in reducing the length of the first stage of labour.The mechanism by which it acts in the context of labour has not yet been elucidated, and the evidence for its efficacy was previously largely anecdotal.[2]

Following intravenous administration, HBB is rapidly distributed (half-life = 29 minutes) into the tissues. Its onset of action after intravenous dosing is 10 minutes, peak effect is seen at 20-60 minutes, and action lasts for two hours, with an elimination half-life of 4.8 hours.It does not pass the blood–brain barrier, and plasma protein binding is low; approximately half of the clearance is via the renal system and the main metabolites found in urine have no significant clinical action. The advantages of intravenous route in a controlled manner are its rapid onset of action and bypass of hepatic metabolism. The rectal route is also popular for this reason.

Almost all the studies reviewed reported a statistically significant reduction in the duration of the first stage of labour.[5–12]Only one study reported no difference in the duration of labour but it was discovered that the baseline characteristics of the patients recruited into the study were different statistically.On the other hand however, the duration of the second and third stages of labour was similar in almost all the groups of women studied implying that the action of HBB is primary on the cervix, and not so much on promotion of uterine activity.This is an important point to consider as it obviates the concerns regarding an excessively rapid second stage, which can predispose to both maternal complications (such as an increased risk for lacerations) and neonatal complications (such as intracranial haemorrhage from rapid, uncontrolled decompression of the foetal head at delivery).

The request for opioid analgesia was significantly lower among the study populations compared to the control group in tandem with meta-analysis by Rohwer et al[1] suggesting the possible efficacy of HBB in acting as an analgesic in addition to its role in

augmentation of labour. The average blood loss at delivery was identical in both groups of patients in all the studies reviewed. This further suggested that HBB has no adverse effect on the contractile ability of the uterus in the postpartum period, as might be theoretically deduced based on its anti-parasympathetic pharmacological actions.[10]Caesarean delivery rates are equally similar across the groups. Only one study reviewed the rate of instrumental delivery which was said to be proportionately higher among the controlsthoughstatistically insignificant.[4]

Overall, there was no difference in the median APGAR scores of the babies in the two groups. In fact, a particular study reported a lower but statistically insignificant APGAR scores among the control group and attributed this to the additionaldoses of opioid analgesia thereforesuggesting that there were no clinically significant effects of HBB on any of the major organ systems of the neonates.[14]There was also no difference in the incidence or severity of cardiotocographic changes intra-partum (decreased beat-to-beat variability and fetal tachycardia are potential adverse effects of HBB) or of neonatal tachycardia.[4]The need for admission to the NICU was comparable in all groups and no significant differences were reported.Of all the studies reviewed, there were no signi?cant adverse effects noted in the group of women who receivedHBB compared to the control groups. Dryness of the mouth and maternal tachycardia were the common adverse effects documented.Additional drugs such as drotaverin and atropine have been considered with less effective result when compared with HBB.[11,13,15]

HBB can also be administered safely intramuscularly, intravenously or rectally without any alteration in its effectiveness.Some authors have reported a high efficacy of HBB suppositories in the shortening the duration of the first stage of labour[12,14]while others reported the ineffectiveness of rectal HBB regarding its effect in shortening the first stage of labour.[6]

CONCLUSION

It is obvious from this review that HBB has the potential toshorten the first stage of labour. This isparticularly useful information for regions with limited availability of epidural analgesia.It is important to note that any intervention that can safely reduce the amount of time spent in the painful process of parturition will be greatly appreciated by women. The reduction in first stage duration may also prove to be of particular importance for women with a borderline placental reserve, oligohydramnios, or risk of prolonged variable deceleration during labor, as may be encountered in women with hypertension (both chronic and gestational) or sickle cell anaemia, which is still common in our population. HBB is better in achieving the end result and hence it can be used in modern obstetrics to relieve spasm and to hasten the rate of cervical dilatation, thereby promoting safe delivery.Large, multi-centre well-designed studies in this regard will be highly beneficial.

REFERENCES

1. Rohwer AC, Khondowe O, Young T. Antispasmodics for labour. *Cochrane Database of Systematic Reviews* 2013, Issue 6. Art. No.: CD009243. DOI: 10.1002/14651858.CD009243.pub3
2. Sekhavat L, Karbasi SA, Fallah R, Mirowliai M. Effect of hyoscine butylbromide first stage of labour in multiparus Women.African Health Sciences 2012; 12(4): 408 – 411.
3. Al-Khishali WAH, Rasheed FA, Hussain SA. The Effect of 20 mg Hyoscine Butylbromide on Normal Labor in Iraqi Primi- and Multi-gravida Women. *J AdvSci Res, 2012, 3(4):*

70-73

4. Al Qahtani NH, Al Hajeri F. The effect of hyoscine butylbromide in shortening the first stage of labor: A double blind, randomizedcontrolled clinical trial.Therapeutics and Clinical Risk Management 2011:7; 495–500
5. Tabarraei Y, Dargahi R, Azari M, Mardi A, Rahimi G, Refahi S. The effect of intravenous injection of atropine with hyoscine on the progress of labor in Primiparous women in Alavi hospital, Ardabil, Iran. *Life Sci J* 2013;10(5s):649-651
6. Aldahhan FH, Alwaeely FA and Raheem F. The evaluation of the effect of buscopan (hyoscine-n-butyl bromide) on the duration of labour. *Bas J Surg, 2011; 25 – 29.*
7. Movahed F, Ghaleh TD, Lalooha F. Effect of hyoscine on first stage of labour in full term pregnancy. Res. J. Biol. Sci. 2011; 6(12):648 – 651.
8. *Aggarwal P, Zutshi V and Batra S. Role of Hyoscine N-Butyl bromide (HBB, Buscopan) as labor analgesic. Indian J Med Sci, 2008;62(5):179 – 184.*
9. Aziz M. Effect of rectal hyoscine butyl bromide suppositories on first stage of labor. International Journal of Advanced Research (2014), Volume 2, Issue 4, 128-135
10. Samuels LA, Christie L, Roberts-Gittens B, Fletcher H, Frederick J. The effect of hyoscine butylbromide on the first stage of labor in term pregnancies. BJOG. 2007;114(12):1542–46.
11. Fardiazar Z, Niknami F, Mashayekhi S and Ghojazadeh M. Hyoscine-N-Buytlbromide versus atropine as labour accelerant and analgesic: a randomized clinical trial. Pak. J. Biol. Sci. 2013;16(9):443 – 45.
12. Sirohiwal D, Dahiya K, De M. Efficacy of hyoscine-N-butyl bromide (Buscopan) suppositories as a cervical spasmolytic agent in labour.Aust N Z J ObstetGynaecol. 2005 Apr;45(2):128-9.
13. Srivastava K, Sinha P, Sharma R, Gupta U. A comparative study of the effect of drotaverine hydrochloride with hyoscine butylbromide in first stage of labour. Int J Basic ClinPharmacol 2015;4:488 – 91.
14. Ahmed A,Shedid A. Rectal Hyoscine-N-Butylbromide Safely Accelerates Progress of Labor in Primipara: A Placebo-Controlled Study. J Am Sci 2012;8(8):512 – 516.
15. KirmaniSA, Malla MS, Regoo FM. Efficacy of drotaverine in comparison to hyoscine butylbromide in augmentation of labour. JMS 2012;15(1):39–43.