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

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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 therefore minimize 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.4–14 Routine use of HBB is absent from our protocol despite the potential advantage of significant reduction in the risk of prolonged labour.

Potential benefits of reduced first 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 benefit of a shorter labour process. This is particularly true in regions with limited use of epidural analgesia and opioid

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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 28 years 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 10 minutes. 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 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 2:** Mrs AF is a 25 years old primiparous lady 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 4 hours after commencement of oxytocin showed that her cervical dilatation remained 4cm despite regular, adequate uterine contractions. She had 40mg of HBB intravenously and labour was allowed to progress. Two hours later, she achieved cervical dilatation of 7cm and in another 2 hours, 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 changes called 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. Whereas its analgesic properties are probably negligible in the context of labour, its value lies in the reduced time spent in the first stage, and consequently the reduced overall time spent in pain by the parturient. Literature review revealed very 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.

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. 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. 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 control though
statistically 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
additional doses of opioid analgesia
therefore suggesting 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
cardiocographic changes intra-partum (decreased
beat-to-beat variability and fetal tachycardia are
potential adverse effects of HBB) or of neonatal
tachycardia.\cite{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 significant adverse effects
noted in the group of women who received HBB
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.\cite{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\cite{12,14} while others reported the ineffectiveness of
rectal HBB regarding its effect in shortening the first
stage of labour.\cite{6}

CONCLUSION
It is obvious from this review that HBB has the
potential to shorten the first stage of labour. This
is particularly 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
3. Al-Khishali WAH, Rasheed FA, Hussain SA. The Effect of 20 mg Hyoscine Butylbromide


