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Compare the Mean Duration of Active First Stage of Labour Among Primi Gravida Presenting at Term Treated with and Without Hyoscine

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ABSTRACT

Introduction: Diagnosis of labour onset has been described as probably one of the most difficult decisions made by providers of maternity care. The first stage of labour addresses the goal of thinning or effacing the cervix; dilating or opening it for least 10 centimeters in size adequate for passage of the infant from uterus to the vagina. To compare mean duration of active first stage of labour of primigravida presented at term treated with and without hysocine. This study was a randomized controlled trial conducted at the Department of Gynae and Obstetrics, Pakistan Institute of Medical Sciences, Islamabad from July to December 2022. We studied 60 patients (30 per group) who were admitted for labor trial after obtaining their ethical approval. 20 mg IV hyoscine group received 20 mg hyoscine, while control group received none. Active labor duration was monitored. **Results:** Sixty women consented with an mean age of 25.50±3.45 years. The overall mean duration of the active phase of labour in hyoscine group was 212.62±25.01 minutes and significant (p-value = 0.025) reduction was observed in its duration of the first active stage when compared with conventional group. Maternal age, BMI and foetal weight were used to segregate duration of active stage of labour and there was no significant difference (p value > 0.05). **Conclusion:** Hyoscine decreases the duration of the active phase of labour in primigravdae without any side effects on the mother or or the neonate. Factors such as age of 35 years and above, higher BMI or neonatal weight had no effect on foetal outcomes.

INTRODUCTION

Labor diagnosis constitutes a complicated yet vital decision which providers of maternity care need to make. Through effective uterine contractions the first stage of labour works to shorten the cervix and open it for birth as it dilates to 10 cm or more in diameter. 1 Labor contains two stages known as latent and active. 2 The labor progression in nulliparous women demonstrates distinctive importance since cervical dilatation rates show sudden slope variations between 3 and 5 cm. Healthcare providers can use uterine contraction presence along with cervical dilatation extending beyond 3-5 centimeters to diagnose active labor status. Active-phase labor in nulliparous women lasted on average 4.9 hours. The large standard deviation of 3.4 hours indicates the active phase could progress up to 11.7 hours although the statistical limit was determined.3 Active phase rates of cervical dilation spanned between 1.2 and 6.8 cm/hr. Ideal labor and delivery management create conflicting requirements between clinicians because they must maintain two incompatible positions. The medical community must recognize childbirth as an ordinary natural process through which most women encounter smooth pregnancies. Secondly all birth professionals should prepare for unexpected intrapartum complications which frequently develop quickly. Prolonged labour or dystocia remains a standard birth difficulty and establishes the primary reason for emergency Caesarean section and instrumental delivery procedures.4 The diagnosis of prolonged labour proves difficult to make and healthcare providers face disputes about this condition.5 Prolonged labour impacts roughly 8% of all pregnant women yet occurs at three times higher frequency in primiparous women when compared to multiparous women in Western nations.6 Primiparity coupled with excessive maternal weight gain and

elevated body mass index serve as primary risk elements during pregnancy The risk factors for foetuses comprise excessive birth weight along with outsized head size and rear-back positioning. A drawn-out labor produces worse pain than anticipated which drives women to use more epidural pain relief and risks emergency surgeries. 7 Labor has two distinct phases: the latent phase needs to stay below 8 hours yet the active phase starts at 3 cm dilatation with no slower than 1 cm/hr progression. The active phase begins once dilation reaches 3 centimeters and the patient should demonstrate cervical dilation at a minimum 1 cm per hour. A 4-hour wait is recommended before intervention when the active phase is slow. 9 Lavender and colleagues (2006) randomized 3000 nulliparous women to labor interventions at 2 hours versus 4 hours as recommended by WHO.10 Although the commonest cause, affecting 80 percent of prolonged labours, was inefficient uterine action, 10 percent of cases had the baby's persistent occipito-posterior position the passenger ‘ while a further 10 percent of prolonged labours had cephalo-pelvic disproportion the passages. [11]

Objective

To compare the mean duration of active first stage of labour among primigravida presenting at term treated with and without hysocine.

METHODOLOGY

The study took place at Department of Gynae and Obstetrics Pakistan Institute of Medical Sciences, Islamabad from July 2022 through December 2022. Researchers used non-probability consecutive sampling to obtain data.

Sample size

By using WHO calculator sample size is 60 having 30 in each group level of significance 5%. Power of test 90% then popular standard deviation 27.03 then test value of population mean for hyoscine butylbromide group as 187.73 ± 20.92 minutes and in control group as 231.39 ± 33.14 minutes respectively.[17]

Formula;

$$n = \frac{2\sigma^2(z_{1-\alpha/2} + z_{1-\beta})^2}{(\mu_1 - \mu_2)^2}$$

σ	= Variance	= 27.03
1-α	= Level of Significance = 5%	= 1.96
1-β	= Power of test	= 90%
μ1	= Mean duration of labour in hyoscine group	=187.73 minutes
μ2	= Mean duration of labour in placebo	=231.39 minutes
n	= Sample Size	= 60

Inclusion Criteria

- A woman at term with labor pains meets the study criteria because she has one previous birth between 18 and 35 years old.
- All participants must give their written agreement to join the study by signing consent forms.

Exclusion Criteria

- Patients with diabetes (fasting blood sugar levels >110mg/dl), preeclampsia (systolic blood pressure > 140mm Hg at two separate occasions 12 hours apart with positive urinary spot test) or have ruptured membranes before achieving the active first stage of labor on clinical examination and investigations.
- Patients with Bleeding disorder (INR > 1.0), cardiac murmur, pelvic abnormalities, or previously had uterine procedure as per history and investigations.

Data Collection Procedure

Ethical review committee of the hospital granted approval for the study so that researchers could select 60 patients (30 for each group) from the Obs department of PIMS Hospital who met the established criteria. All patients received written consent while detailed history acquisition followed. The patients were divided randomly through lottery selection into two different groups.

- Group-H: Hysocine
- Group-W: Without Hysocine

Presentation CTG assessments combined with pelvic tests and foetal ultrasound findings should have occurred for every female patient. The labor room staff managed all females according to hospital-established pain management standards. The patients belonging to group-H received a single 20mg iv hyoscine dose at active first stage onset yet the patients from group-W received no medication until active first stage completed. A peroperational definition denoted the active first stage of labour duration which was recorded for every patient. The researchers documented all data and patient demographic facts through the attached proforma. The same group of obs department professionals led by their consultant monitored all trial processes to ensure the removal of bias across all patient management.

Data analysis

The analysis team processed and studied the obtained information using SPSS version 20. The data analysis included numerical variables from age, BMI, foetal weight and active first stage of labor duration presented through mean ±SD ranges. The analysis used independent sample t-test to evaluate active first stage labor duration differences between groups at a p value threshold of 0.05 for statistical significance. The data stratification process took place according to age groups, BMI values and fetal weight. Post stratification. The research adopted T-test as its statistical analysis method while setting a p value ≤0.05 as the critical point for determining significance.

RESULTS

A total of 60 end term pregnant women were enrolled in present study with an overall mean age of 25.50±3.45 years. Mean age of Hyosine group was 25.57±3.45 while without hyoscine group had a mean age of 25.43±3.51 years. Mean ages of both groups were compared and an insignificant difference (p-value = 0.883) was observed depicting normal distribution of data. Age of pregnant women were further segregated in three groups and a high number of primigravid women were found to be in range of 25-29 years of age as 43.3% while only 16.7% primigravid women presented an age of ≥30 years. An overall mean BMI of study subjects was remained to 29.48±1.05 shown to be healthy and lied in range of overweight and particular difference was observed among the participants of both groups as shown in able 1. Further segregation revealed 19 (63.3%) of hyoscine group and 20(66.7%) of conventional treatment group had BMI in range of overweight while rest of 11 (36.7%) and 10 (33.3%) in respective groups were categorized as obese. An overall mean gestational age of study subjects was remained to be 39.50±0.87 weeks and no particular difference was observed among both groups. Head position of babies at term also have significant relationship in outcome of labour and 95% babies had cephalic position of head. There is minor difference in head position of babies among both groups. Overall mean duration of active phase of labour was found to be 212.62±25.01 minutes and significant difference was found among both groups where hyoscine group had significantly (p-value = 0.025) lesser duration of first active stage as compared to conventional group. Vaginal delivery was remained the pre-dominant mode of foetal outcome and 95.0% babies in this study were born through vaginal mode. Only 6.7% neonates in hyoscine group and 3.3% babies in control group was born through cesarean section. Overall mean foetal weight was remained to be 2790.00 ±178.94 grams. There is no significant difference (p-value >0.05) in foetal weight was noted among Hyoscine and conventional treatment groups. Most of the children had normal birth weight while only 11.67% children had slight lower weight in this study. The recommendation to assess Appearance, pulse, grimace, activity and respiration (APGAR) scores occurs five minutes after birth revealed normal and equal mean scores in this research. Among all newborns 15% received initial APGAR scores which were below the normal range yet all neonates became normal when reassessed after five minutes. A significant statistical difference (p-value <0.05) emerged while splitting labour duration management according to maternal age between two groups consisting of women younger than 25 and those between 26 through 35 years old. Research showed a significant BMI-dependent (p-value <0.05) separation of labor duration between BMI categories. Patients were allocated into two BMI-defined age groups since the other groups remained ineligible.

Table 1

Comparison of age, BMI, gestational age, and head position for both groups

Characteristics	Study Group	Mean	Standard Deviation	p-value	t-value
Age	Hyoscine	25.57	3.45	0.859	0.061
	Conventional	25.43	3.51		
	Overall	25.50	3.05		
BMI	Hyoscine	29.49	1.08	0.859	0.061
	Conventional	29.47	1.03		
	Overall	29.48	1.05		
Gestational Age	Hyoscine	39.47	0.97	0.238	-0.293
	Conventional	39.53	0.78		
	Overall	39.50	0.87		
Head Position	Hyoscine				
	Cephalic	29	96.7%		
	Breech	1	3.3%		
	Conventional				
	Cephalic	28	93.3%		
	Breech	2	6.7%		
	Overall				
	Cephalic	57	95.0%		
	Breech	3	5.0%		

Table 2

Comparison of the mode of delivery among both groups

Characteristics	Study Group	Vaginal	%	Cesarean Section	%	p-value	Pearson Chi Value
Mode of Delivery	Hyoscine	28	93.3%	2	6.7%	0.554	0.351
	Conventional	29	96.7%	1	3.3%		
	Overall	57	95.0%	3	5.0%		

Table 3

Comparison of fetal weight, APGAR score, and the segregation of the duration of active stage by age, BMI, and fetal weight for both groups

Characteristics	Study Group	Mean	Standard Deviation	p-value
Fetal Weight	Hyoscine	2787.67	184.72	0.747
	Conventional	2792.33	176.10	
	Overall	2790.00	178.94	
APGAR Score (5 min)	Hyoscine	7.57	1.01	0.460
	Conventional	7.67	0.92	
	Overall	7.62	0.96	
Duration of Active Stage (by Age)	≤ 25 Years			<0.0001

	Hyoscine	189.50	14.29	
	Conventional	231.41	10.86	
	26-35 Years			<0.0001
	Hyoscine	195.00	18.69	
	Conventional	235.46	11.98	
	Overall			<0.0001
	Hyoscine	192.07	16.43	
	Conventional	233.17	11.34	
Duration of Active Stage (by BMI)	Overweight			<0.0001
	Hyoscine	189.32	15.14	
	Conventional	230.80	10.88	
	Obese			<0.0001
	Hyoscine	196.82	18.20	
	Conventional	237.90	11.28	
	Overall			<0.0001
	Hyoscine	192.07	16.43	
	Conventional	233.17	11.34	
Duration of Active Stage (by Fetal Weight)	Normal			<0.0001
	Hyoscine	189.88	16.06	
	Conventional	232.22	11.07	
	Low			<0.0132
	Hyoscine	206.25	12.34	
	Conventional	241.67	12.34	
	Overall			<0.0001
	Hyoscine	192.07	16.43	
	Conventional	233.17	11.34	

DISCUSSION

Normal labor management demanded expertise-level understanding and applied medical knowledge. Each obstetrician seeks to prevent labor prolongation from happening. The main objective for obstetricians involves delivering the baby while minimizing risks to both fetus and mother during the shortest possible delivery time. Healthcare providers have pursued active labor control methods for decades to reduce both labor risks and duration of painful labor simultaneously. Labor management practices seek to decrease both cesarean birth rate and maternal-fetal complications because prolonged labor represents a primary threat to perinatal well-being.11 Sapasmolytic drugs are used often as they help overcome cervical spasm which leads to shorter labor duration between uterine contractility and cervical dilation.12 One of these spasmolytics is hyoscine-n-butylbromide which exerts a spasmolytic action on the smooth muscle of the gastrointestinal tract, biliary and genitourinary tracts. 13 Presently overall mean duration of active phase of labour was found to be 212.62±25.01 minutes and significant difference was found among both groups where hyoscine group had significantly (p-value = 0.025) lesser duration (192.07±16.43 minutes) of first active stage as compared to conventional group not given hyoscine (233.17±11.33minutes). Results from this case control study match findings that examined 120 primigravida at term during active labor in three equally divided groups. The experiment involved injecting intravenously a single dose of placebo and two doses of hyoscine at 20mg and 40mg to groups A, B, C. Researchers recorded the first stage timing beginning at cervical dilatation to four centimeters until full cervical expansion was observed. The first stage duration was shorter in participants taking 20mg or 40mg of hyoscine compared to control participants (187.73 ± 20.92, 186.41 ± 19.40 vs. 231.39 ± 33.14 minutes).14 The explanation for this lies in hyoscine's primary action site on the cervix without affecting uterine contractility. Both the parturient women and her fetus experience heightened risks when second-stage delivery duration shortens through uterine contractions enhancement. On the other hand, if it exerted an inhibitory action on uterine activity, it can expose the woman to hazards of atonic postpartum hemorrhage and retained placenta. 15 The study was done on age group ranging from 18 to 35 years old, patients aging less than 18 years or more than 35 years were excluded from our study as pregnancy in this age group consider high risk pregnancy. 16 The mata-analysis concluded, although, the effect of hyoscine was minimal when multigravidas and primigravidas women were considered together, the hyoscine was clinically effective in primigravida and multigravida women for shortening the first and the second stages of labor. Results of this meta-analysis differed from the current findings because it examined the effects of hyoscine on multigravidas as well as primigravidas although the study only included primigravidas. The investigators evaluated APGAR values at five minutes during this research project. The World Health Organization maintains established benchmarks that govern child growth along with infant developmental restrictions. The typical birth weight of an infant falls between 3.2 to 3.4 kg (7 to 7 1/2 pounds). Healthy full-term newborns typically weigh between 5 pounds 11 ounces and 8 pounds 6 ounces which equals to 2.6 to 3.8 kilograms.

CONCLUSION

The ability of fetuses who have minimal reserve together with women who have medical conditions to tolerate uterine contractions depends on their reserve capacity which leads to reduced cesarean sections. Medical research confirms HYOSCINE does not influence the second and third phases of labor. The procedure of accelerating the second birthing stage results in higher risks of maternal and fetal delivery complications. Labor duration reduces through Hyoscine use while primiparous women experience no adverse effects on their maternal or neonatal health. birey who is 35 years old or younger and has listed BMI and birthweight measurements did not lead to adverse effects on fetal results.

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