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ORIGINAL RESEARCH

Effect of Intramuscular Hyoscine-N-Butyl Bromide on Tubal Spasm and Pain Perception in Women with Infertility Undergoing Hysterosalpingography: A Randomised Controlled Trial

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Abstract

Background: A tubal patency test is essential in evaluating women with infertility. Hysterosalpingography (HSG) is the investigation of choice for assessing tubal patency.
Objective: To evaluate the effect of intramuscular hyoscine-N-butyl bromide on tubal spasms and pain perception during hysterosalpingography.
Methods: This randomized, controlled trial was conducted at the Radiology Departments and Infertility Clinics of four health institutions in Bayelsa State, Nigeria, between January 2021 and April 2022. Five hundred and twenty infertile women undergoing hysterosalpingography were randomized into two groups. Women in group I (control) received a placebo, while women in Group II (experimental) received 20 mg of intramuscular hyoscine-N-butyl bromide. Pain scores at different steps of the procedure were recorded.
Results: The overall mean pain scores progressively decreased from contrast instillation (4.97 ± 2.08) through 30-minutes post-procedure (3.54 ± 1.54) to 24 hours post-procedure (1.96 ± 1.78). Pain scores at contrast instillation, 30 minutes and 24 hours after HSG were significantly lower in the hyoscine group compared to the placebo group (p = 0.001 each). There were significantly fewer women with tubal blockage in the hyoscine group compared to the placebo group [78 (30.0%) vs 131 (50.4%); p = 0.001].
Conclusion: Intramuscular hyoscine-N-butyl bromide before hysterosalpingography significantly reduces pain and tubal spasm during the procedure.

Keywords: Diclofenac, Hyoscine-N-butyl bromide, Hysterosalpingography, Infertility, Pain, Tubal spasms.

Introduction

Globally, approximately one in six couples are affected by infertility, which is defined as the inability of a couple to conceive after one year of adequate and regular unprotected, peno-vaginal, ejaculatory sexual intercourse. [1] Tubal patency testing is essential in evaluating women with infertility, and hysterosalpingography (HSG) is the investigation of choice for assessing tubal patency. [2] Most women report that the HSG procedure is painful, especially during the instillation of the radiological contrast media. [3,4] Many drugs have been used to provide pain relief in HSG, including oral paracetamol, non-steroidal anti-inflammatory drugs and opioids; parenteral paracetamol, non-steroidal anti-inflammatory drugs and opioids; and topical and intrauterine lignocaine preparations.[5,6]

Hyoscine-N-butyl bromide (HnBB) is an anti-spasmodic agent that alleviates abdominal cramps. It binds to muscarinic receptors on smooth muscle cells, thus blocking synaptic cholinergic transmission. Hyoscine-N-butyl bromide prevents neural impulse conduction in pelvic-abdominal parasympathetic ganglia by binding to nicotinic receptors.[7,8] There are very few published researches on the effect of HnBB on pain perception during and after HSG.

Jitchanwichai and Soonthornpun reported that the administration of HnBB was associated with a significant reduction in pain perception during and 15 minutes after HSG, compared to placebo. [9] In contrast, Abbas *et al*. concluded that HnBB had no benefit for pain reduction during and after HSG.[10] A systematic review and meta-analysis by Aboshama *et al*.[11] corroborated the finding of Jitchanwichai and Soonthornpun and recommended further RCTs to evaluate the benefit of HnBB for pain relief during HSG owing to the small number and size of studies included in their review.

During HSG, there may be transient muscular spasms of the cornual portion of the fallopian tube encased by the uterus's smooth muscle. This may be mistaken for actual pathological obstruction of the proximal fallopian tube. [12] Cornual spasm is reversible but may persist for over 15 minutes. If suspected, the HSG study is paused for some minutes to allow resolution of the spasm. Alternatively, parenteral HnBB (Buscopan®) is administered to relax the muscle spasm. [1,13] Jitchanwichai and Soonthornpun found a significant reduction in tubal spasms during HSG with HnBB. This study sought to evaluate the effect of intramuscular HnBB on pain perception in infertile women undergoing HSG.

Methods

Study design and setting

This randomized, controlled trial was conducted at the Radiology Departments and Infertility Clinics of the Federal Medical Centre, Yenagoa, Niger Delta University Teaching Hospital, Okolobiri, Diete Koki Memorial Hospital, Yenagoa, and Silhouette Radiodiagnostic Consultants, Yenagoa, all in Bayelsa State, Nigeria. It was conducted between January 2021 and April 2022. The first two study centres are tertiary health institutions that provide specialized gynaecological services to women in Bayelsa State and serve as referral centres for other hospitals in Bayelsa State and surrounding Rivers and Delta States, all in South-South Nigeria. The third study centre is a secondary health facility, while the fourth study centre is the largest radiodiagnostic facility in Bayelsa State, Nigeria.

Sample size

The sample size for this study was calculated using the formula:

$n = (Z\alpha + Z\beta)^2 \times 2 \times p\ (1 - p) / d^2$ [14] where n = minimum sample size, Zα = 95% confidence level = 1.96, Zβ = 20% β error (at 80% power) = 0.84, p = proportion of women with infertility which was 18.2% (0.182) from a previous study in Bayelsa State, South-South Nigeria. [15]

d = expected margin of error = 10% = 0.1.

Substituting these values into the sample size formula,

$n = (1.96 + 0.84)^2 \times 2 \times 0.182(1 - 0.182) / (0.1)^2$

$n = 7.84 \times 0.364 \times 0.818 / 0.01$

$n = 2.33 / 0.01$

n = 233 (minimum sample size per group).

Allowing for an attrition rate of 10% (23.3), n becomes 256.3, rounded off to 260.

Therefore, the calculated sample size was 260 per group, giving a total of 520 study participants.

Inclusion criteria: All infertile women undergoing hysterosalpingography, who consented to participate in the study, were included.

Exclusion criteria: Menstruating women, those with abnormal uterine/vaginal bleeding, cervicovaginal discharge, cervical stenosis/cervical pathology, evidence of pelvic inflammatory disease, previous history of contrast hypersensitivity, history of allergy to HnBB, and women that declined consent or incompletely filled the consent form and questionnaire, were excluded from the study.

Randomization: Five hundred and twenty women with infertility undergoing hysterosalpingography were enrolled in the study. The study participants were recruited from the Infertility Clinics of the study centres. Following adequate counselling, written informed consent for participation in the study was obtained from the participants. The aim of the study, the procedure and the potential benefits were explained to the women. Their baseline sociodemographic and gynaecological characteristics were obtained and recorded on a purpose-designed proforma.

Using the simple randomization technique, eligible women who consented to participate in the study were equally randomized into two groups –I (control) and –II (experimental), using a computer-generated list of random numbers (generated from www.randomization.com). Allocation concealment was achieved with the use of dark concealed envelopes. Both the patients and the clinicians were blinded. Women in group I received a placebo with 1 ml of water for injection manufactured by Medlab Pharmaceuticals, India. Women in Group II received 20mg (1 ml) intramuscular HnBB (Buscopan®, manufactured by Sanofi Consumer Healthcare). The HSG was performed in the Radiology Departments of the study centres.

Procedure: HSG was performed during the proliferative phase of the menstrual cycle (days 7 – 10). Women in Groups I and II were administered *statum* doses of placebo and intramuscular HNBB, respectively. Five minutes after administering the medications, the patient was positioned on the X-ray table, and a scout supine anteroposterior X-ray view of the pelvis was taken. She was then placed in the lithotomy position.

After hand washing and putting on sterile gloves, the radiologist cleaned the woman's perineum anteroposteriorly with 1% chlorhexidine solution (Savlon®). A warm vaginal speculum was inserted into the vagina to expose the cervix, which was also cleaned with Savlon®. The anterior lip of the cervix was held with a tenaculum, and a self-retaining cannula was inserted into the cervical canal. Twenty millilitres of warm contrast media (Urographin) were instilled into the uterine cavity under fluoroscopic guidance. Gentle traction was applied on the tenaculum holding the anterior lip of the cervix to elongate the cervical canal, aligning it parallel to the x-ray beam. The vaginal

speculum was removed to improve the patient's comfort. Spot images of the endometrial canal, fallopian tubes and intraperitoneal spillage were obtained. The Wong–Baker Faces Pain Rating Scale [16, 17] was used to document the level of pain experienced by the women at different stages of the procedure by an assistant blinded to the randomization (Figure 1).

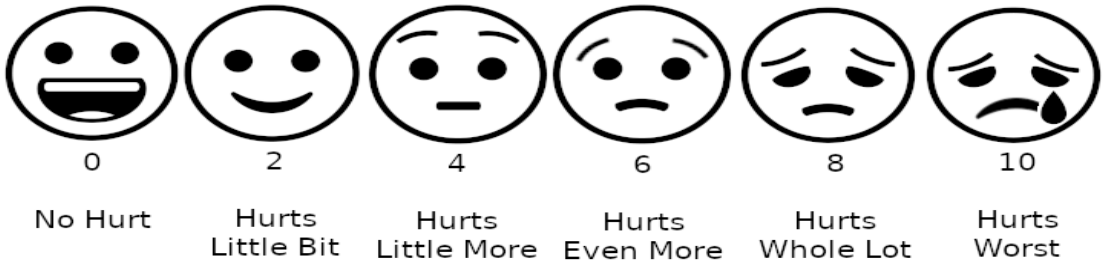

Figure 1: Wong–Baker Faces Pain Rating Scale[16,17]

The HSG films were reported by Consultant Radiologists, who also discussed the study findings with the women. Thirty minutes and 24 hours after the procedure, the level of pain that the women felt was recorded using the Numerical Rating Scale (Figure 2). [18, 19] This is the most familiar scale to grade pain. The patient rated the level of pain on a scale of 0 to 10 on each occasion. A score of 0 indicated no pain, 1 – 3 suggested mild pain, 4 – 6, moderate pain, and 7 – 10, severe pain. [18]

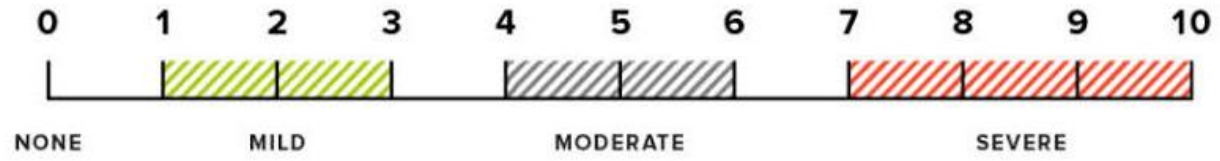

Figure 2: Numerical Rating Scale (Figure 2).[18,19]

Study outcome measures: The primary outcomes were the effect of HnBB on tubal blockage and pain scores at different stages of the HSG procedure. The secondary outcomes included differences in pain scores between the study groups. A clinician (for each centre) who was not involved in the procedure was responsible for pain assessment.

Data analysis

The CONSORT Flow Diagram on the procedure of recruitment of participants is shown in Figure 3. The data were entered into a pre-designed proforma and were analysed using Statistical Product and Service Solutions for Windows® version 25 (SPSS Inc.; Chicago, USA). The results were presented in frequencies and percentages for categorical variables and mean and standard deviation for continuous variables. The student's t-test was used to compare sample means, and the Chi-Square test was used to compare the proportion of women who had tubal blockage between the two groups; and those who expressed pain during the instillation of contrast media, 30 minutes and 24 hours after the procedure, between the two groups. *P* value < 0.05 was considered statistically significant.

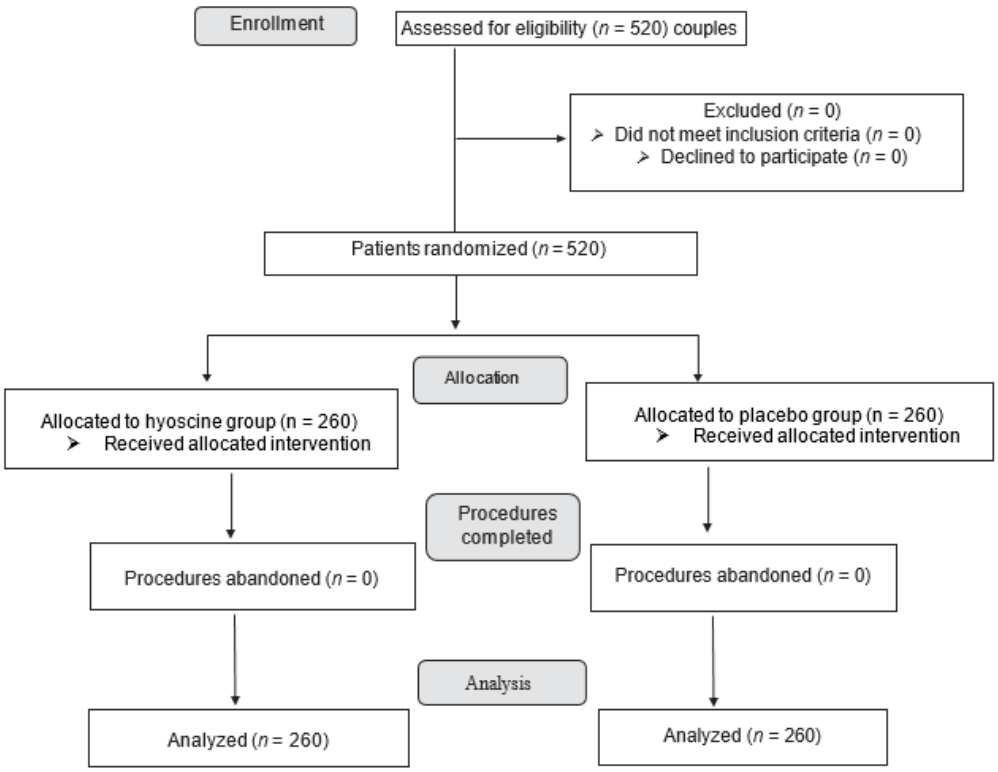

Figure 3: CONSORT Flow diagram

Ethical considerations: Ethical approval for this study was obtained from the Research and Ethics Committee of the Federal Medical Centre, Yenagoa, Bayelsa State (FMCY/REC/ECC/2022/453). The study was also registered with the Pan African Clinical Trial Registry (PACTR202203661514392).

Results

Sociodemographic characteristics

The mean age of the participants was 32.5 ± 5.8 years, with a modal age group of 31-35 years (210/260; 40.4%). There was a statistically significant difference in the mean age between the two study groups, with those in the placebo group having a higher mean age than those in the hyoscine group (33.8 ± 4.3 years vs 31.2 ± 6.7 years; p = 0.001). One-half (261; 50.2%) of the women had primary/secondary education, and the majority (462; 88.8%) were either overweight or obese, with a mean BMI of 29.3 ± 4.3 kg/m^2. The differences in the level of education (p = 0.756), occupation (p = 0.748), and mean BMI (p = 640) between the two study groups were not statistically significant. These sociodemographic characteristics are shown in Table I.

Table I: Sociodemographic characteristics of participants

Characteristics	*Total*	*Study Groups*		*Test of significance*	*p-value*
	n = 520 (%)	*Hyoscine*	*Placebo*		
		n = 260 (%)	*n = 260 (%)*		
Age group (years)					
21 – 25	48 (9.2)	28 (10.8)	20 (7.7)	1.81[a]	0.771
26 – 30	106 (20.4)	50 (19.2)	56 (21.5)		
31 – 35	210 (40.4)	104 (40.0)	106 (40.8)		
36 – 40	106 (20.4)	52 (20.0)	54 (20.8)		
>40	50 (9.6)	26 (10.0)	24 (9.2)		
Mean age ± SD in years	32.5 ± 5.8	31.2 ± 6.7	33.8 ± 4.3	5.13[b]	0.001
Level of education					
Primary	56 10.8)	26 (10.0)	30 (11.5)	0.56[a]	0.756
Secondary	205 (39.4)	106 (40.8)	99 (38.1)		
Tertiary	259 (49.8)	128 (49.2)	131 (50.4)		
Occupation					
Unemployed	119 (22.9)	58 (22.3)	61 (23.5)	2.69[a]	0.748
Civil servant	116 (22.3)	63 (24.2)	53 (20.4)		
Trader	114 (21.9)	58 (22.3)	56 (21.5)		
Professional	59 (11.3)	26 (10.0)	33 (12.7)		
Farmer	58 (11.2)	32 (12.3)	26 (10.0)		
Artisan	54 (10.4)	25 (9.6)	29 (11.2)		
Body mass index categories (kg/m^2)					
Normal weight	58 (11.2)	27 (10.4)	31 (11.9)	2.75[a]	0.430
Overweight	288 (55.4)	138 (53.1)	150 (57.7)		
Mild Obesity	114 (21.9)	60 (23.1)	54 (20.8)		
Moderate obesity	60 (11.5)	35 (13.5)	25 (9.6)		
Weight (kg)	77.8 ± 11.8	80.3 ± 9.3	75.3 ± 13.4	4.88[b]	0.001
Height (m)	1.63 ± 0.07	1.60 ± 0.08	1.66 ± 0.03	11.44[b]	0.001
Mean body mass index (kg/m^2)	29.3 ± 4.3	29.4 ± 4.6	29.2 ± 4.1	0.49[b]	0.640

[a] Chi-Square test; [b] Student's t-test.

Gynaecological and infertility characteristics

More than three-quarters (415; 79.8%) of the participants were nulliparous, with parity ranging from 0-3. The predominant type of infertility was secondary (308; 59.2%), and the mean duration of infertility was 3.3 ± 2.2 years. Characteristics that were significantly different between the hyoscine and placebo groups included mean age at menarche (15.0 ± 2.1 years vs 14.1 ± 1.5 years; p = 0.001) and mean duration of infertility (2.4 ± 1.6 years vs 4.1 ± 2.4 years; p = 0.001). As depicted in Figure 4, two-fifth (209; 40.2%) of the women had a tubal blockage. There were significantly fewer women with tubal blockage in the hyoscine group compared to the placebo group (78; 30.0% vs 131; 50.4%, p = 0.001). Other gynaecological characteristics are shown in Table II.

Table II: Gynaecologic and infertility characteristics of women undergoing HSG

Characteristics	*Total* *n = 520 (%)*	*Study Groups*		*Test of significance*	*p-value*
		Hyoscine *n = 260 (%)*	*Placebo* *n = 260 (%)*		
Parity					
Nulliparity	415 (79.8)	209 (80.4)	206 (79.2)	0.51[a]	0.777
Primiparity	83 (16.0)	39 (15.0)	44 (16.9)		
Multiparity	22 (4.2)	12 (4.6)	10 (3.8)		
Median parity (range)	0 (0 – 3)	0 (0 – 3)	0 (0 – 1)	32324.0[b]	0.234
Age at menarche (years)					
11 – 13	147 (28.3)	69 (26.5)	78 (30.0)	1.29[a]	0.525
14 – 16	349 (67.1)	177 (68.1)	172 (66.2)		
17 – 19	24 (4.6)	14 (5.4)	10 (3.8)		
Mean age at menarche ± SD in years	14.5 ± 1.8	15.0 ± 2.1	14.1 ± 1.5	5.98[c]	0.001
Duration of marriage (years)					
1 – 5	249 (47.9)	120 (46.2)	129 (49.6)	0.67[a]	0.715
6 – 10	172 (33.1)	88 (33.8)	84 (32.3)		
> 10	99 (19.0)	52 (20.0)	47 (18.1)		
Mean marriage duration ± SD in years	5.9 ± 5.3	6.1 ± 3.2	5.7 ± 6.9	0.85[c]	0.393
Number of children					
None	435 (83.7)	217 (83.5)	218 (83.8)	2.15[a]	0.342
1 – 2	72 (13.8)	34 (13.1)	38 (32.3)		
3 – 4	13 (2.5)	9 (3.5)	4 (1.5)		
Median number of children (range)	0 (0 – 3)	0 (0 – 3)	0 (0 – 1)	35724.0[b]	0.164
Type of infertility					
Primary	212 (40.8)	112 (43.1)	100 (38.5)	1.15[a]	0.285
Secondary	308 (59.2)	148 (56.9)	160 (61.5)		
Duration of infertility (years)					
1 – 5	304 (58.5)	148 (56.9)	156 (60.0)	0.51[a]	0.477
6 – 10	216 (41.5)	112 (43.1)	104 (40.0)		
Mean duration of infertility ± SD in years	3.3 ± 2.2	2.4 ± 1.6	4.1 ± 2.4	9.64[c]	0.001

[a] Chi-Square test; [b] Mann-Whitney U Test; [c] Student's t-test.

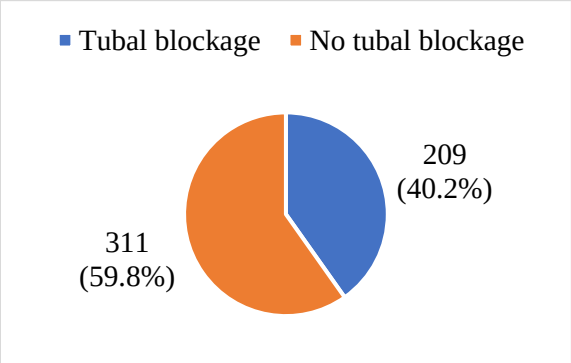

Figure 4: Proportion of participants with tubal blockage

Duration of procedure and pain intensity during and after HSG

The mean duration of HSG was 4.60 ± 1.15 minutes. The overall mean pain scores progressively decreased from contrast instillation (4.97 ± 2.08) through 30-minutes post-procedure (3.54 ± 1.54) to 24 hours post-procedure (1.96 ± 1.78). Pain scores at contrast instillation, 30 minutes and 24 hours after HSG were significantly lower in the hyoscine group compared to the placebo group (p = 0.001 each). Women in the hyoscine group experienced no pain 24 hours post-procedure. On the other hand, women in the placebo group had a mean pain score of 3.91 ± 1.37 twenty-four hours after HSG, with 104 (40.0%) experiencing mild pain and 156 (60.0%) with moderate pain. At contrast instillation, significantly more women in the hyoscine group experienced moderate pain [182 (70.0%) vs 131 (50.4%); p = 0.001) compared to the placebo group, in which significantly more women experienced severe pain [79 (30.4%) vs. 26 (10%); p = 0.001] at this step. Thirty minutes after HSG, more than three-quarters (208; 80.0%) of the women in the hyoscine group only experienced mild pain. The same proportion (206; 79.2%) of women in the placebo group experienced moderate pain at this time. These differences were statistically significant (p = 0.001).

Patients with tubal blockage had higher mean pain scores at contrast instillation, 30 minutes and 24 hours post-HSG, than those without tubal blockage. Amongst patients with tubal blockage, those who received hyoscine felt significantly less pain during contrast instillation, and at 30 minutes and 24 hours post-HSG (p = 0.001 each), compared to those who received placebo. Thirty minutes after HSG, all the women with tubal blockage who had hyoscine experienced only mild pain. In contrast, the majority of those in the placebo group (77, 58.8%) had significant moderate pain (p = 0.001). Twenty-four hours after HSG, 79 (60.3%) women with tubal blockage who received a placebo expressed mild pain, while 52 (39.7%) felt moderate pain. Conversely, none of those who received hyoscine experienced any pain. This difference in pain intensity between the two groups was statistically significant (p = 0.001). These findings are shown in Tables III to V and Figure 5.

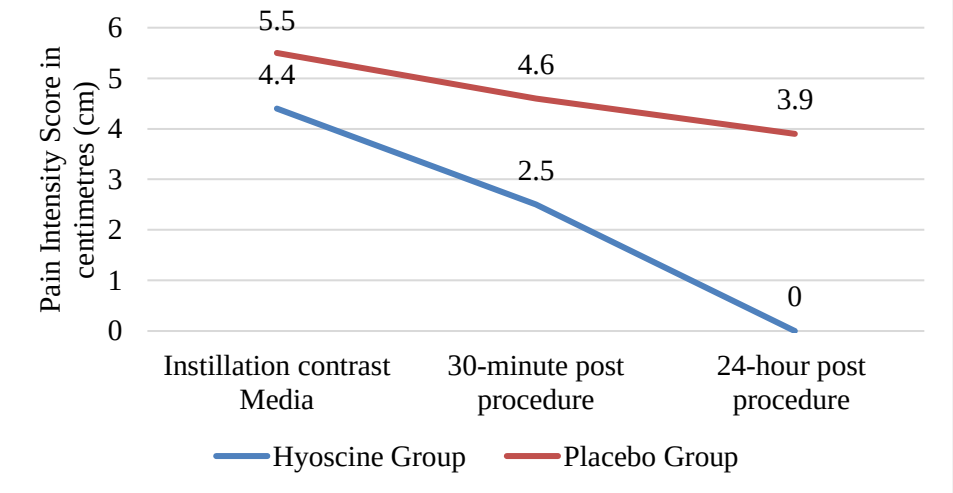

Figure 5: Progression of pain intensity from the instillation of contrast media to 24 hours post-procedure

Table III: Duration of procedure and pain intensity scores among women in the hyoscine and placebo groups

Characteristics	*Total* *Mean ± SD*	*Study Groups* *Hyoscine* *Mean ± SD*	*Placebo* *Mean ± SD*	*T-test* *(p-value)*
Mean duration of the procedure (mins)	4.60 ± 1.15	4.20 ± 0.75	5.00 ± 1.89	9.19 (0.001)
Total study population				
Mean pain score during instillation of contrast media	4.97 ± 2.08	4.40 ± 1.57	5.54 ± 2.36	6.51 (0.001)
Mean pain score 30-minutes post procedure	3.54 ± 1.54	2.50 ± 0.92	4.58 ± 1.30	21.09 (0.001)
Mean pain score 24 hours post procedure	1.96 ± 1.78	0.00 ± 0.00	3.91 ± 1.37	45.99 (0.001)
Women with tubal blockage				
Mean pain score during instillation of contrast media	5.25 ± 1.76	4.29 ± 1.43	6.61 ± 1.20	15.03 (0.001)
Mean pain score 30-minutes post procedure	3.80 ± 1.45	2.81 ± 0.90	5.19 ± 0.76	24.41 (0.001)
Mean pain score 24 hours post procedure	1.93 ± 2.48	0.00 ± 0.00	4.63 ± 1.49	41.93 (0.001)
Women without tubal blockage				
Mean pain score at instillation of contrast media	4.55 ± 2.42	4.49 ± 2.72	4.65 ± 1.82	0.48 (0.634)
Mean pain score 30-minutes post procedure	3.16 ± 1.58	1.77 ± 0.42	3.98 ± 1.44	13.27 (0.001)
Mean pain score 24 hours post procedure	2.01 ± 1.66	0.00 ± 0.00	3.21 ± 0.74	38.16 (0.001)

Discussion

The mean age of the participants in this research was 32.5 ± 5.8 years, with the largest number of women with infertility within the age range of 31 – 35 years, followed by 36 – 40 years. Some other studies have reported similar mean age and age range among women being evaluated for infertility. [9,20–23] This buttresses that as a woman's age increases, fecundity declines, mainly due to diminishing ovarian reserve and abnormal HSG findings associated with increasing age. [24] About one-half of the women in this study were educated up to the tertiary level. This may be because many women in the environment now prefer to complete their education before getting married and attempting pregnancy. More than one-half of the women in this study had secondary infertility. Contributory factors include the high prevalence of sexually transmitted infections, pelvic inflammatory disease, post-abortion, puerperal sepsis and postoperative infections, as seen in a previous study in our study centres. [25]

Pain is a major side effect of HSG. Pain is perceived at different points during HSG, which includes insertion of a vaginal speculum, grasping of the anterior lip of the cervix, insertion of an intrauterine cannula, and instillation of contrast media. Pain may even persist for a few hours after the procedure. [26] Many medications have been used to provide pain relief during HSG with varying results. This RCT was conducted to

assess the effect of HnBB on the reduction of pain and tubal spasm in women undergoing HSG. Cornual spasm is known to cause a false suggestion of tubal occlusion. [9,20] spasm is common at the proximal part of the fallopian tube due to the narrow lumen and thick muscular layer of the tube at this point.

Table IV: Pain intensity at the instillation of contrast media among women with and without tubal blockage in the hyoscine and placebo groups

Characteristics	*Total Population n = 520 (%)*	*Study Groups*		*Chi-square (p-value)*
		Hyoscine n = 260 (%)	*Placebo N = 260 (%)*	
Instillation of contrast media				
Total study population				
Mild pain	102 (19.6)	52 (20.0)	50 (19.2)	35.10 (0.001)
Moderate pain	313 (60.2)	182 (70.0)	131 (50.4)	
Severe pain	105 (20.2)	26 (10.0)	79 (30.4)	
Women without tubal blockage				
	n = 311 (%)	n = 182 (%)	n = 129 (%)	
Mild pain	35 (11.3)	35 (19.2)	0 (0.0)	75.78 (0.001)
Moderate pain	215 (69.1)	138 (75.8)	77 (59.7)	
Severe pain	61 (19.6)	9 (4.9)	52 (40.3)	
Women with tubal blockage				
	n = 209 (%)	n = 78 (%)	n = 131 (%)	
Mild pain	67 (32.1)	17 (21.8)	50 (38.2)	6.53 (0.038)
Moderate pain	98 (46.9)	44 (56.4)	54 (41.2)	
Severe pain	44 (21.1)	17 (21.8)	27 (20.6)	

In the present study, pain scores at contrast instillation, 30 minutes and 24 hours post-HSG were significantly lower in the women who received HnBB than in the placebo group. This finding is in accordance with a systematic review and meta-analysis by Aboshama *et al*.[11] However, their study was limited by the few RCTs reviewed, and therefore, it recommended further RCTs to evaluate the benefit of HnBB for pain relief during HSG.[11] The finding in the present study is, however, in contrast with those of other authors, who reported no clinically significant difference in pain scores between women who received HnBB and those who did not.[9,10,20,27]

This study revealed that pain perception was highest during the instillation of contrast media. Pain at this step is due to the distension of the uterine cavity and fallopian tubes by contrast media, which leads to the local release of prostaglandins. Other studies have reported similar findings. [5,10,26,28] In contrast, grasping the cervix and insertion of the cervical cannula was reported by Liberty *et al*. as the most painful step during HSG.[29] Patients with tubal blockage had higher mean pain scores at contrast instillation, 30 minutes and 24 hours post-HSG, than those without tubal blockage. This finding is in tandem with the results in a previous study, where women with abnormal findings on HSG expressed more pain than those without pathologies. [24] The plausible reason for the higher mean pain scores in women with tubal blockage may be due to more mechanical distension of the uterine cavity by contrast media (in the presence of blocked fallopian tubes), which may lead to more local release of prostaglandins. The pain perceived after the procedure is due to the irritation from the peritoneal spillage of contrast media.

Table V: Pain intensity 30 minutes and 24 hours post procedure among women with and without tubal blockage in the hyoscine and placebo groups

Duration after procedure	*Total Population*	*Study Groups*		*Chi-square (p-value)*
		Hyoscine	*Placebo*	
Pain intensity at 30 minutes post-procedure				
Total study population	n = 520 (%)	n = 260 (%)	n = 260 (%)	
Mild pain	262 (50.4)	208 (80.0)	54 (20.8)	182.44 (0.001)
Moderate pain	258 (49.6)	52 (20.0)	206 (79.2)	
Women without tubal blockage				
	n = 311 (%)	n = 182 (%)	n = 129 (%)	
Mild pain	130 (41.8)	130 (71.4)	0 (0.0)	158.32 (0.001)
Moderate pain	181 (58.2)	52 (28.6)	129 (100.0)	
Women with tubal blockage				
	n = 209 (%)	n = 78 (%)	n = 131 (%)	
Mild pain	132 (63.2)	78 (100.0)	54 (41.2)	72.59 (0.001)
Moderate pain	77 (36.8)	0 (0.0)	77 (58.8)	
Pain intensity at 24 hours post-procedure				
Total study population	n = 520 (%)	n = 260 (%)	n = 260 (%)	
No pain	260 (50.0)	260 (100.0)	0 (0.0)	704.26 (0.001)
Mild pain	104 (20.0)	0 (0.0)	104 (40.0)	
Moderate pain	156 (30.0)	0 (0.0)	156 (60.0)	
Women without tubal blockage				
	n = 311 (%)	n = 182 (%)	n = 129 (%)	
No pain	182 (58.5)	182 (100.0)	0 (0.0)	407.73 (0.001)
Mild pain	25 (8.1)	0 (0.0)	25 (19.4)	
Moderate pain	104 (33.4)	0 (0.0)	104 (80.6)	
Participants with tubal blockage				
	n = 209 (%)	n = 78 (%)	n = 131 (%)	
No pain	78 (37.3)	78 (100.0)	0 (0.0)	262.31 (0.001)
Mild pain	79 (37.8)	0 (0.0)	79 (60.3)	
Moderate pain	52 (24.9)	0 (0.0)	52 (39.7)	

This study also revealed that HnBB was effective in the reduction of tubal spasms during hysterosalpingography. This is evidenced by the fact that women in the hyoscine group had a significantly lower incidence of tubal blockage and vice versa. This finding agrees with the reports of Jitchanwichai and Soonthornpun [9] and Alper *et al.* [30] but contrasts with the results of Abbas *et al.*[10] and Safi *et al.*[20] who reported no association between HnBB and relief of tubal spasms.

The strength of this study lies in the fact that it was a double-blinded RCT with a larger sample size than those of previous studies in the region. Also, we used two pain scoring scales for better assessment and documentation of the level of pain perception. The study is, however, limited by the fact that it is regional, and it may be difficult to generalize its findings. This study provides important data on the effect of HnBB on pain perception and tubal spasms during HSG.

Conclusion

Intramuscular HnBB before HSG significantly reduced pain and tubal spasm during HSG. Therefore, it is recommended to be administered before HSG for pain relief and tubal spasm reduction.

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