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A COMPARATIVE STUDY OF OUTCOME OF FIRST TRIMESTER MEDICAL TERMINATION OF PREGNANCY BY MANUAL VACUUM ASPIRATION AND ELECTRIC VACCUM ASPIRATION IN A GOVERNMENT MEDICAL COLLEGE.

Obstetrics & Gynaecology

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ABSTRACT

Aim To compare safety and efficacy between the electric vacuum aspiration and manual vacuum aspiration in first trimester MTP. **Objectives** 1>To compare the time duration between the two procedures. 2>To compare the blood loss between the two procedures. **Material and method-** Comparative study was conducted in the department of Obstetrics and Gynecology, AGARTALA GOVERNMENT MEDICAL COLLEGE AND GBPH from Oct 2018 - Sept. 2020(1½years), among reproductive aged women attending Obstetrics and Gynaecology OPD who are interested to undergo surgical method of termination of pregnancy with period of gestation <12 weeks; total 156 patients were subjected for study. **Result-** Among the 156 women were enrolled in the study, 78 women had undergone MVA and 78 women EVA; maximum number of cases were in the age group of 26 - 30 years, followed by that of 21 – 25 years, least number of cases were in the age group ≤ 20 years. There. In MVA, average blood loss during the procedure is less by 4 ml as compared to EVA in 5 to 10 weeks gestation but beyond 10 weeks the blood loss is less in EVA as compared to MVA by 10 ml. Maximum number of cases was between 8 to 10 weeks period of gestation. In the MVA group, 47% of cases had Grade II pain & in the EVA group, 60% cases had Grade IV pain. So, the pain appreciated by patients in MVA procedure is very less (of Grade II) as compared to EVA (of Grade IV). Mean average time taken in MVA procedure is less by 2.5 minutes as compared to EVA Procedure in < 10 weeks gestation. It is statistically 'Highly Significant' ($p < 0.001$).but in >10 wks gestation MVA has to be charged multiple times and more time consuming compared to EVA. **Conclusion-** A safe and effective procedure of termination of termination of pregnancy is the need of the hour. Both MVA and EVA are established safe and effective surgical method of first trimester MTP. MVA is inexpensive; its simplicity of use and the proof that MVA has a safety and efficacy profile similar to other contemporary methods of MTP could encourage the physician to adopt MVA as a preferred method of choice as a safe effective and user friendly procedure for rural set up of developing country like ours.

KEYWORDS

INTRODUCTION

Over the past twenty years, the health evidence, for providing safe, comprehensive abortion care have evolved greatly. However, despite these advances, based on 2008 data, WHO estimates that there are approximately 22 million unsafe abortions annually, resulting in 47 000 deaths and 5 million complications resulting in hospital admission [1].

Search for a procedure for surgical method of medical termination of pregnancy which is safe, user friendly, less costly, wider acceptability and effective method with minimum complication is on search for quite a long period.

Use of curettage has been banned by the WHO for first trimester evacuation as it causes more injury to uterus and cervix as well as increased pain during the procedure.

Vacuum aspiration in the form of electrical vacuum is being used for a long period. Manual vacuum aspiration has evolved as a great aspiration as low cost equipment with wide scope of use.

In our institution for last 1 year as the programme of first trimester MTP with MVA is going on. We want to compare different procedure related factors on the use of MVA and EVA as first trimester surgical MTP procedure.

In this study, we examine the safety and efficacy of manual vacuum aspiration over that of the electric vacuum aspiration. Looking for a safer device, that could be placed in the hands of a primary health centre medical officer or even a lady health visitor.

Currently available method for first trimester abortion are vacuum aspiration and medical evacuation with misoprostol and mifepristone. But vacuum aspiration has come up as the most widely used and as most successful method.

Abortion still continues to be a significant cause of maternal mortality and morbidity, so a means of safe and effective method for procuring medical termination of pregnancy is on high demand.

METHODOLOGY

AIM:

To compare safety and efficacy between the electric vacuum aspiration and manual vacuum aspiration in first trimester MTP.

OBJECTIVES:

- 1>To compare the time duration between the two procedures.
- 2>To compare the blood loss between the two procedures.

MATERIALS AND METHOD

The present study was conducted in the department of Obstetrics and Gynecology, AGARTALA GOVERNMENT MEDICAL COLLEGE AND GBPH.

Study Design: COMPARATIVE STUDY.

Study Setting: The study was conducted in the Department of Obstetrics and Gynecology, Agartala Government Medical College & GBPH.

Study Period: 1 1/2 year (From Oct 2018 - Sept. 2020).

Study population: Those patients who are interested to undergo surgical method of termination of pregnancy with period of gestation less than 12 weeks.

Sample Size – Total sample size is 156.

Inclusion Criteria-

1. Hemoglobin level > 7 g/dl
2. Upto 12 weeks of pregnancy (clinically assessed)
3. No clinical sign of infection (fever, offensive discharge or generalized lower abdominal pain)

Exclusion Criteria-

1. Associated medico surgical complication.
2. Hemorrhagic disorder and treatment with anticoagulants.
3. Uterine infections.

Data Collection Procedure

After getting approval of the institutional ethical review committee the study has started. Women attending outdoor department of obstetrics and Gynaecology fulfilling inclusion &exclusion criteria, is included in this study . A total of 156 pregnant women were included in the study after obtaining informed consent from them. MVA and EVA were performed on 78 women each.

A detailed history was taken in a questionnaire including age. Chief complain, past obstetrical and menstrual history, any contraceptive method taken previously, any past medical or surgical history etc were noted. ABO grouping and RH typing, hemoglobin estimation, viral marker was done.

Cases were selected randomly and subjected to vacuum aspiration by either MVA or EVA. Local anaesthesia or sedation was used as per suitability to the patient. Instruments used for MVA were manual vacuum aspirator, Sim's posterior vaginal speculum, anterior vaginal wall retractor, vulsellum, rubber catheter and Karman's cannula. Per vaginal examination done after emptying the bladder. Sim's posterior vaginal speculum was introduced to hold the cervix. Cannula was inserted through the cervix and size of uterus noted. Dilation of cervix was done with gradually larger sized cannula.In MVA cannula of appropriate size was inserted into the uterine cavity and cavity contents were evacuated. After that contents of the syringe were kept in a clear receptacle of clean water for examination.

For EVA, suction apparatus and jar were connected to electric source. The cervix was dilated with metal dilators. Suction cannula fitted to the suction apparatus was then introduced into the uterus, taking care to place the tip of the cannula in the middle of the uterine cavity. The pressure of the suction apparatus was raised to 400-600 mm of Hg. The cannula was moved up and down and rotated within the uterine cavity with pressure on cavity contents were evacuated.

During these procedures, relation of gestational age at termination, blood loss, post operative pain score, complications, time duration for the procedures, need for the repeat evacuation were compared between two procedures.

Data Analysis: -Data was entered in SPSS version 20 and analysis was done for finding out p value **($p < 0.001$)**.

RESULT AND ANALYSIS

In both procedures, maximum numbers of cases were in the age group of 26 - 30 years, followed by that of 21 – 25 years, least number of cases were in the age group ≤ 20 years. There is no statistical difference ($p > 0.05$) in the age of the patients in both groups. The age distribution of the participating women is given in Table 1.

There is a highly significant difference in the blood loss in MVA as compared to EVA ($p < 0.001$). In MVA, average blood loss during the procedure is less by 4ml as compared to EVA in 5 to 10 weeks gestation but beyond 10 weeks the blood loss is less in EVA as compared to MVA by 10 ml. Blood loss according to the period of gestation is shown in table no.2.

Maximum number of cases were between 8 to 10 weeks period of gestation. As mean average time taken in MVA procedure is less by 2.5 min as compared to EVA procedure. It is statistically **'Highly significant' ($p <$** 0.001). But it was interesting to note that the duration for procedure is less in MVA than EVA in below 10 weeks period of gestation. As the period of gestation increases the duration of the procedure also increases but above 10 weeks periods of gestation the MVA aspirator has to be charged multiple times and also there is clogging of the opening of the cannula that results in more time consumption. Distribution of the study subjects according to gestational age (weeks) and time taken (minutes) is shown in table no.3.

In the MVA group, 47% of cases had Grade II pain & in the EVA group, 60% cases had Grade IV pain. So, the pain appreciated by patients in MVA procedure is very less (of Grade II) as compared to EVA (of Grade IV). This is statistically highly significant ($p<0.005$). Pain comparison in between MVA & EVA is shown in table no.4.

Regarding the complications there are more number of cervical injury in EVA as compared to MVA. So, MVA is safe with less complication due to procedure. Complication of both (EVA & MVA) procedure is shown in table no.5.

In the present study, 42% in MVA & 47% in EVA preferred OCP as the contraceptive method. Barrier method was preferred next to OCP. Number of cases according to contraceptive method adopted in both procedures is shown in table no.6.

DISCUSSION

Vacuum device was first described in medical science in 1800's and allowed the development of suction aspiration method of abortion. Invention of Karman's cannula a flexible plastic cannula which replaced earlier metal models in 1970, reduced the occurrence of perforation and made suction and aspiration methods under local anaesthesia.

Every woman has the right to decide whether to continue the unwanted pregnancy or terminate it. In the present study most of the women were multiparous and concieved during the 1 year of the last child birth. So simplified and safe method of MTP is in search from 1970, various studies has been done to focus on MVA and EVA, but limited studies has been done to compare between MVA and EVA.

In our study most of the patients who underwent MVA were comfortable in choosing MVA in subsequent MTP, which was not the same with EVA. Rather due to more pain and bothersome noise subjects in EVA were reluctant to choose it in subsequent pregnancy. So the acceptability of MVA is more as compared to EVA.

MVA being a office procedure and noiseless aspiration is the better method than EVA in a rural setup. The present study has been undertaken to compare between MVA and EVA as a method of termination of pregnancy in first trimester.

The time taken for the procedure, blood loss, appreciation of pain, rate of complications, cost effectiveness, success rates and patient satisfactions have been studied and compared between MVA & EVA.

In the present study the maximum number of patients seeking for MTP were in the age group of 26-30 years (39.1%) and mostly multiparous women (62.2%) within 8 to 10 weeks of pregnancy. **Kamel et al.** [4] 2011 reported that majority of cases in their study were in the age group of 20-30 years. **Samal et al.**[6] 2014 reported time maximum number of MTP seeker were in the age group of 20-29 years. **Westfall et al.**[5] also reported that majority of the MTP were done from 20 to 29 years age group (63.6%). Multiparous women constituted maximum number of patients in both study groups.

In the present study, there was a significantly less time consumed for MVA procedure as compared to EVA procedure ($p = 0.000$). So, MVA helped save the time of both the patient & the clinician. Our present study results were comparable with Dutta B K et al. (2017) [7], **Das Vinita et al.** (2005)[8], **Goldberg A B et al.** (2004)[2] and **Kamel Helen (2012) et al.** [4] study. As, Mean average time taken in MVA procedure is less by 2.5 minutes as compared to EVA procedure. It is statistically 'highly significant' ($p < 0.001$). Our result were comparable to **Dutta B K et al.** (2017) [7] where time consumed in MVA was 5 minutes lesser than EVA.

Blood loss was 28.45±5.56 ml in MVA over 36.68±6.66 in EVA in **Kerure SB et al.** (2013) [3] study 35.4±16.8 min and 41.6±18.2 min in MVA and EVA respectively in a study by **Goldberg AB (2004)**. [2], similar to present study of 31.4±8.3 ml in MVA over 36.7±6.7 ml in EVA group which was statistically highly significant p value = 0.000. This was mainly attributed due to less time taken in MVA over EVA.

The pain appreciated in MVA was less as compared to EVA which was highly significant (p value< 0.05). In the MVA group, 47% of cases had Grade II pain & in the EVA group, 60% cases had Grade IV pain. So, the pain appreciated by patients in MVA procedure is very less (of Grade II) as compared to EVA (of Grade IV).

The complications in MVA group was 3.8%% as compared to 11.5 in

EVA group in the present study. **Das vanita et al.**[8] and **Goldberg et al**.[2] had relatively more complications in MVA group as 9% and 2% as compared to 6% and 2% in EVA group respectively. In the present study cervical laceration in EVA and MVA was 4% and 1% respectively. Incomplete evacuation was more in EVA as compared to the MVA i.e. 5% and 2% respectively. As the aspirator is rotated 360 degree either clockwise or anticlockwise exposing the total uterine cavity towards the cannula opening which is not possible with tubing attached with the EVA machine.

Success rates were interpreted based on the number of cases for whom re-aspiration was done for incomplete abortion and retained products of conception. In the present study, MVA showed a 94.2% success rate as compared to EVA with 90%. **Das vinita et Al.** [8] had 96.91% and 98% success rates with MVA and EVA respectively.

CONCLUSION

MVA is a much safe and effective alternative to traditional electric vacuum aspiration. It is also relatively easy to perform and requires simple training for the health care provider. The manual aspiration equipment is inexpensive. Its simplicity of use and the proof that MVA has a safety and efficacy profile similar to that of EVA, could increase the number of physicians who can offer MTP to their patients. Another important aspect is its portability and low-cost making it a technique best suited for the infrastructure in rural areas. MVA is a promising method compared to EVA which can be practiced widely in rural areas where access to medical facilities are limited, high-tech equipment are not available, erratic power supply and poor maintenance of instruments. The judicious use of MVA comes with a promise to make early abortions safe and easily accessible to women of both rural and urban societies belonging to any socioeconomic strata.

In our study the blood loss associated with MVA is significantly less as compared to EVA. The efficacy of MVA over EVA in regards of complete evacuation is much higher. The procedure time is also much less with MVA as compared to EVA in below 10 weeks of pregnancy. The pain perception was also low in MVA subjects over EVA subjects. Finally the acceptance of MVA for subsequent use for MTP was more as compared to EVA. MVA being safe, simple effective, low cost, less time consuming device which makes it a technique best suited for infrastructure in rural areas. MVA is a promising method compared to EVA which can be practised widely in rural areas where the access of medical facility are limited, high technique equipments are not available, erratic power supply and maintenance of power supply is not up to mark.

A safe and effective procedure of termination of termination of pregnancy is the need of the hour. Both MVA and EVA are established safe and effective surgical method of first trimester MTP. MVA is inexpensive, its simplicity of use and the proof that MVA has a safety and efficacy profile similar to other contemporary methods of MTP could encourage the physician to adopt MVA as a preferred method of choice.

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Declarations
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Conflict Of Interest: none

Ethical Approval: The protocol of this research work was approved by the Institutional Ethics Committee, Agartala Government Medical College.

Table no.1- The age distribution of the participating women.

Age (years)	MVA (n=78)	EVA (n=78)	Total	Percentage (%)
<20	8	5	13	8.3
21-25	22	22	44	28.2
26-30	26	35	61	39.1
31-35	11	9	20	12.8
>35	11	7	18	11.5
	78	78	156	100%

$\Psi^2 = 19.95$ p =0.644

Table no.2- . Blood loss according to the period of gestation.

Weeks of gestation	MVA Mean ± SD(ml)	EVA Mean ± SD(ml)	t- value	p-value
5	20.43±0.5	21.43±0.1	-3.41	<0.05,HS
6	23.46±0.3	27.98±1.6	-10.84	0.000,HS
7	28.42±0.22	32.35±0.18	45.28	0.000,HS
8	28.41±0.21	35.05±1.65	-15.9	0.000,HS
9	33.4±0.21	38.99±0.38	-44.9	0.000,HS
10	36.06±1.8	53.6±0.24	-16.79	0.000,HS
11	54.16±1.8	45.5±0.7	-5.9	0.01,HS
12	61.15±1.2	48.12±0.7	18.17	0.000,HS

Table no.3- Distribution of study subjects according to gestational age(weeks) and time taken (minutes).

Weeks of gestation	No of subjects in MVA	No of subjects in EVA
5	3	3
6	10	15
7	12	10
8	18	16
9	11	13
10	17	16
11	2	3
12	5	2

Weeks of gestation	MVA(n = 7 8) Mean S.D	EVA(n = 7 8) Mean S.D	T – Value	P - Value
5	4.5 0.51	5.060.05	-1.8	0.24
6	4.69 0.16	5.10.17	-6.46	0.000
7	5.30.31	9.161.10	-10.54	0.000
8	6.761.1	11.23 0.26	-15.47	0.000
9	8.81.2	12.2 0.24	-9.25	0.000
10	10.1 0.15	11.410.46	-10.30	0.000
11	12.330.41	10.65 0.49	4.15	0.025
12	12.25 0.35	10.960.29	4.992	0.004

Table no.4- Pain comparison in between MVA & EVA

Grades of pain	MVA (n = 156)	EVA (n = 156)	Total	%
Grade I	28	0	28	27.5
Grade II	37	13	50	43.5
Grade III	10	19	29	19.8
Grade IV	3	46	49	8.9

Table no.5- Complication of both (EVA & MVA) procedure.

Types of complications	MVA	EVA
No Complication	75	69
Cervical Injury	1	4
Incomplete Evacuation	2	5
Perforation	0	0
Infection	0	0

Table no.6- Number of cases according to contraceptive method adopted in both procedures.

Contraceptive Method	MVA (n = 78)	EVA (n = 78)	Total	%
Tubectomy	2	3	5	3.02
IUCD	15	16	31	19.8
OC Pills	33	37	70	44.8
Barrier Method	28	20	48	30.7
None	0	2	2	1.2

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