
ORIGINAL PAPER

**INDUCED ABORTION IN THE MIDTRIMESTER IN ADOLESCENTS
AND YOUNG WOMEN AT THE DEPARTMENT OF OB&GYN AT
UNIVERSITY CLINICAL CENTER TUZLA**

**Azra HADŽIMEHMEDOVIĆ
Azur TULUMOVIĆ***Department of Gynaecology and
Obstetrics, University Clinical Cen-
ter Tuzla,**Tuzla, Bosnia and Herzegovina**Received: 18.01.2010**Accepted: 16.09.2010***Correspondence to:***Azra Hadžimehmedović
Department of Gynaecology and
Obstetrics
University Clinical Center Tuzla
Trnovac bb, 75000 Tuzla,
Bosnia and Herzegovina**phone: +387 61 193 472**email: azrahadzi@bih.net.ba***ABSTRACT**

Between March 2008 and November 2009, we carried out a prospective study among adolescent and young women (14 - 24 years old) terminating a pregnancy at 13-23 weeks of gestation at Department of Ob&Gyn at University Clinical Center Tuzla. A total of 31 women were included into the study. The women were categorized into two groups: the study group of those who had procedure with application of laminaria alone (N=18) and the control group of those who had preparation with Pg gel in addition (N=13). We analyzed the age, parity, gestational age, the time between application of laminaria and the start of abortion, indications for abortion, risks and complications. The average age of women was 20.0 years $\pm$ 2.8 and most of the patients were nuliparus (77.5%). In the study group the average age of women was 20.0 $\pm$ 2.7 and the most of the patient were nuliparus (72.2%). In the control group the average age of the women was 20.0 $\pm$ 2.9 and most of the patient were nuliparus (84.6%). The indications for abortion were: fetal anomaly (19.3%), maternal disease (9.7%), miscarriage (16.0%), PPRM (13.0%) and artificial abortion (42.0%). Average length of procedure since applications of laminaria or Pg gel until the end of abortion was 45 $\pm$ 31.01 hours. In the study group the average length of procedure since application of laminaria until the end of abortion was 38 $\pm$ 24.6 hours. In the control group the average length of procedure since application of Pg gel till the end was 56 $\pm$ 33.8 hours. We did not have any complications in the study and control groups. We did not observe any significant side effects during or after the procedure.

Keywords: *adolescents, young women, abortion, laminaria*

INTRODUCTION

Not every pregnancy is a wanted pregnancy and termination of pregnancy is a response to unplanned pregnancy.¹ The World Health Organization (WHO) defines an unsafe abortion as „a procedure of terminating an unwanted pregnancy carried out either by a person lacking the necessary or in an environment lacking the minimal medical standards, or both“.¹ Every year about 210 million women throughout the world become pregnant, 15% of pregnancies end in miscarriages and stillbirths, 22% in induced abortions and 63% in live births.¹

Data of abortion rate in adolescents were different and range from low rate (10-20/1000) in Czech Republic, Denmark, Norway, Finland, England, Wells, Sweden, Slovenia, over middle in USA where is 29/1000 to very high in Russian Federation 56/1000.²

In Bosnia and Herzegovina legal abortion is permitted by 10th week of gestation and between 10th and 20th week of gestation it is permitted by decision of special committee.³ Underage patients need the permission of their parents.³ In Slovenia and Turkey abortion is permitted until 10 weeks, in Belgium until 14 weeks

Table 1. Indications for induction of abortion

Indications for abortion	Study group		Control group	
	N	%	N	%
Artificial abortion	6	33.6%	7	53.9%
Fetal anomaly	3	16.6%	3	23.1%
Miscarriage abortion	3	16.6%	2	15.4%
PPROM	3	16.6%	1	7.7%
Maternal disease	3	16.6%		

and in The Netherlands until 22 weeks of pregnancy.¹ Abortion is completely prohibited in Ireland and Malta.¹

Termination of pregnancy is the worst method for planning the family, but in some situation is the only solution.⁴ Pregnancy of adolescents and young women is associated with a range of outcomes detrimental to adolescent health, including complications of pregnancy, illegal or unsafe abortion, and death, especially in less developed nations.³ Induction methods of termination of pregnancy in II trimester are: dilatation and evacuation; placement of laminaria tents; instillation of hypertonic solutions; induction with prostaglandins (PGE₂-dinoprost; PgF₂alfa-dinoprost); hysterotomy and misoprostol alone or with mifepristone.⁵

Laminaria tents are made of the stems of the algae *Laminaria digitata* and *Laminaria Japonica*. Laminaria was mentioned for the first time in the Chinese literature that dates back over 1000 years. Laminaria tents have been used in ripening the cervix for over 100 years.⁶ They were first used in the U.S. and Japan, and have been used in Denmark and Sweden for over 80 years.^{6,7} Attempts to dilate the cervix with cervical dilators in patients in early second trimester abortions without cervical preparation or maturation can lead to an increased incidence of cervical tears and lacerations, cervical incompetence, where early miscarriages occur due to the unable cervix to hold a pregnancy, uterine perforation, bowel injury, retained products of conception, bleeding, or maternal death.⁷ The complication rate is reduced by 20 to 40% by using Laminaria.⁶ Laminaria works by its hygroscopic (swelling) action and induce the abortion process. Laminaria tents have been used prior to patients undergoing first trimester surgical abortion procedures (up to 12 weeks) for over 100 years in the U.S.⁶ They reduce the

incidence of morbidity (complications) related to the abortion procedure and the tents are associated with minimal side effects.⁵

We aimed to assess the efficacy and safety of midtrimester termination of pregnancy using laminaria alone or in a combination with PG gel followed by Prostaglandins 15 M in adolescents and young women.

MATERIALS AND METHODS

Between March 2008 and November 2009 we carried out a prospective study of termination of pregnancy (13-23 weeks of gestation) among adolescents and young women at Department of Ob&Gyn at University Clinical Center Tuzla. A total of 31 patient, study group (N=18) and control group (N=13), aged 14 - 24 years were included. Termination of pregnancy was carried out by tree-step uterine cervical dilation using laminaria followed by prostaglandins 15 M IM up to 5 injections and Syntocinon 10 IU followed by instrumental evacuation of the uterus. Study was conducted at Department of Ob&Gyn at University Clinical Center Tuzla.

The standard stick (laminaria) was approximately 4 cm in length and 8 mm in diameter. The Laminaria stick was individually packaged and sterilized using gamma-irradiation (Processed in U.S.A. by: MedGyn Products). Laminaria were placed into the cervix during ten minutes procedure at 9 p.m. These laminaria stayed in the cervix overnight, absorbing fluids from the cervix. Next day, after 12 hours if cervix was soft and beginning to open, procedure was continued with Prostin 15M IM (up to 5 ampules per 24h) (Prostin 15M IM injections, carboprost, manufacturer „Pfizer Manufacturing Belgium, Belgium, packing in ampules of 250 micrograms per ml solution). If there were

regular contractions procedure was continued with Syntocinon infusion („Rotexmedica„ Trittenau, Germany, packing in ampules of 10 IU Oxytocin per ml of solution). After evacuation the cavity of the uterus was revised by curette. In patients of control group where we first applied Prepidil gel (dinoproston, „Pfizer Manufacturing Belgium, Belgium, packing in siring) and 12 hours later laminaria procedure was further the same. Antibiotics were used since the beginning of procedure and were continued 7 days after with uterine tonisation by ergometrin preparations.

The statistics (middle value, standard deviation, correlation coefficient, t-test) were used to analyze the age, parity, gestational age, indication for induced abortion and the length of procedure between the study and control group.

RESULTS

This study included 31 patients. The average age of the patients was 20.0 ± 2.8 . In the study group average age of women was 20.0 ± 2.7 and most of the patient were nuliparus (72.2%). In the control group average age of the women was 20.0 ± 2.9 and most of the patient were nuliparus (84.6%). We observed no statistically significant difference between the age groups according to the order of abortion ($t=0.06$; $df=27$; $p=0.951$).

One third (35.5%) of patients (11) were 14-19 years old, and 64.5% (20) patients 20-24 years old. We have 38,9% (7) patients 14-19 years old, and 61,1% (11) patients 20-24 years old in study group. We have 30,8% (4) patients 14-19 years old, and 69,2% (9) patients 20-24 years old in control group. Out of 31 patients we have 77.4% (24) nulipara, 16.1% (5) primipara and 6.5% (2) secundipara.

In the study group we have 72.2% (13) nuliparus, 22.2% (4) primipara and 5.6% (1) secundipara. In control group we have 84.6% (11) nuliparus, 7.7% (1) primipara and 7.7% (1) secundipara.

We have mostly induction of abortion between 13 and 17 weeks of gestation in both groups. Also we have 3

patients with 21 weeks of gestational in control group and one with 23 weeks of gestation in study groups.

Indications for induction of abortion were artificial abortion 42.0%, miscarriage 16.0%, PPRM 13.0%, fetal anomaly 19.3% and maternal disease 9.7%.

Indications for induction of abortion in study group were artificial abortion 33.6% (6), miscarriage 16.6% (3), PPRM 16.6% (3), fetal anomaly 16.6% (3) and maternal disease 16.8% (3) (Table 1).

Indications for induction of abortion in control group were artificial abortion 53.9% (7), fetal anomaly 23%, miscarriage 15.4% (2) and PPRM 7.7% (1) (Table 1).

Average length of procedure since application of laminaria till the end was 45 ± 31.01 hours.

In the study group the average length of procedure since application of laminaria until the end of abortion was 38 ± 24.6 hours. In the control group the average length of procedure since application of Pg gel till end was 56 ± 33.8 hours (Table 3). In 9 patients after first insertion of laminaria we had no changes of cervix so we repeated the procedure. In this patients length of procedure was 83 ± 36.03 (Table 2.).

There was a statistically significant difference in the average length of procedure according to the order of abortion ($t=2.22$; $df=27$; $p=0.035$).

DISCUSSION

In the period 1987-1993 adolescents in Department of Gynaecology and Obstetrics of Tuzla, Bosnia and Herzegovina, obtained 16.21% abortion in second trimester (13 to 20 weeks) of gestation.³ Also in war period 1991 to 1993 we notified rise in number of abortion among adolescent patients, especially 10 to 14 weeks of gestation.⁸ We have in our study 36% (11) adolescents 14-19 years old (38.9% in study and 30.8% in control group).

In our study, the indication for induced abortion in

Table 2. The way of beginning and the length of procedure between the study and the control group

Group	Number of patients N	%	Length (hours)-average value	P value
Study group	18	58%	38 ± 24.6	p=0.035
Control group	13	42%	56 ± 33.8	

most number artificial abortion ("social" indications) (33.6% in study and 53.9% in control group), fetal anomaly (16.6% in study and 23.0% in control group), miscarriage abortion (16.6% in study and 15.4% in control group) and maternal diseases 16.8% (study group). Obata-Yasuoka et al reported that the indication for induced abortion in most number fetal anomaly (43.9%), miscarriage abortion (24.3%), maternal diseases (6.9%) and PPROM (4.0%).⁹

Late second-trimester pregnancy termination after multiple cesarean sections by laminaria dilatation and evacuation is probably not associated with an increased perioperative risk.¹⁰ In our study only one patient has one cesarean section.

Hern and all (1977) published that after application of laminaria during 3 days they've got good results and the length of procedure was between 42 and 49 hours.¹¹ In our study in the study group in which procedure was preformed with laminaria average length was 38 hours. In case of 9 patients with repeated application of laminaria length of procedure was 83 hours.

In one study where procedure was started with laminaria and continued with gemeprost (Pg) results were good for the examined group (with previous SC) and for a control group (without previous SC). They did not have any complication.¹²

In a review of almost 12,000 patients undergoing D&E between 12 and 26 weeks, blood loss exceeding 500 ml and cervical laceration were the most common complications, each affecting approximately 0.9% of the patients. In those women with 19-26 weeks gestation, cervical laceration was significantly reduced (0,9%) when laminaria were used.⁵

The policy of combining laminaria with an intramuscular prostaglandin analogue appeared, at the time of development of the regimen, to minimize the induction-to-abortion interval and the risk of cervical injury.¹² In our study after application of laminaria we use Pg ampules IM and get no side effects except mild nausea and vomiting.

Previous studies show that the usage of Laminaria reduces the incidence of complications by 1/5 prior to using dilators (rods used to open the cervix), than using dilators alone.^{12,9}

Abortions occurring in the first and second trimester of pregnancy are associated with certain known complications (cervical tears and lacerations, injuries to the cervical musculature, uterine perforation, cervical incompetence).^{13,14} In incomplete abortion we have higher chances of uterine infection or bleeding.¹⁵ Com-

plications mentioned above we did not have in our study.

CONCLUSION

Medico-social importance of this problem is that these patients usually did not finish their reproductive role. Reduction of the need for induced abortion in adolescents and young women and prevention of unsafe abortion through good family planning services should be a integral part of health care in every country. Given that it is non-invasive, efficient, with low rate of early complication, easy to use, the method is acceptable both for the patients and for the medical staff.

REFERENCES

1. Pinter B. Medico-legal aspects of abortion in Europe. *Eur J Contracept Reprod Health Care* 2002; 7: 15-19. PMID:12041859
2. Singh S, Darroch JE. Adolescent pregnancy and childbearing Levels and Trends in Developed Countries. *Fam Plann Perspectives* 2000; 32 (1): 14-23. doi:10.2307/2648144 PMID:10710702
3. Balic D. Gynecological problems of adolescents (Ginekološki problemi adolescentnog doba). Master degree thesis, Med faculty Tuzla, 1993.
4. Davis VJ. Induced Abortion Guidelines. *J Obstet Gynaecol Can* 2006; 28 (11): 1014-1027.
5. Omeragic F. Use of prostaglandins in late pregnancy interruption (Primjena prostaglandina u prekidu odmakle trudnoce). Master degree thesis, Med faculty Tuzla, 1999.
6. Hern W. Laminaria versus Dilapan osmotic cervical dilators for outpatient dilation and evacuation abortion: Randomized cohort comparison of 1001 patients. *Am J Obstet Gynecol* 1994; 171: 324-328.
7. Palmer LJ, Palmer XY. Dilation and Evacuation. In: Palmer LJ, Palmer XY. *Encyclopedia of Abortion in the United States*. Jefferson, North Carolina: McFarland & Company, 2009: 126-127.
8. Balic A, Balic B, Lazarevic C, Balic D, Odobasic D, Seleskovic E. Induced abortion of adolescents girls in Tuzla from 1991 to 1993 (Namjerni prekid trudnoce kod adolescentica u Tuzli u periodu 1991-1993. god.) *Acta Med Sal* 1995; 24 (1-2): 13-16.
9. Obata-Yasuoka M, Hamada H, Watanabe H, Shimura R, Toyoda M, Yagi H, Takeshima K, Abe K, Nakamura Y, Ogura T, Fujiki Y, Yoshikawa H. Midtrimester termination of pregnancy using gemoprost in combination with laminaria in women who have previously undergone cesarean section. *J Obstet Gynaecol* 2009; 35 (5): 901-905.
10. Ben-Ami I, Schneider D, Svirsky R, Smorgick N, Pansky M, Halperin R. Safety of late second trimester pregnancy termination by laminaria dilatation and evacuation in patients with previous multiple cesarean sections. *Am J Obstet Gynecol* 2009; 201: 154-155. doi:10.1016/j.ajog.2009.04.029 PMID:19539892
11. Hern W, Oakes A. Multiple laminaria treatment in early mid trimester outpatient suction abortion: a preliminary report. *Planned Parenthood* 1977; 12: 93-97.
12. WHO. Medical methods for termination of pregnancy. Ge-

neva, 1997.

13. Stubblefield P, Carr-Ellis S, Borgatta L. Methods for Induced abortion. *Obstet Gynaecol* 2004; 104: 174-185. doi:10.1097/01.AOG.0000130842.21897.53 PMid:15229018

14. Hammond C. Recent advances in second-trimester abor-

tion: an evidence-based review. *Am J Obstet Gynaecol* 2009; april: 347-356.

15. Rana A, Pradhan N, Gurung G, Singh M. Induced septic abortion: A major factor in maternal mortality and morbidity. *J Obstet Gynaecol* 2004; 30 (1): 3-8.