# Prospective, observational, multicentre data collection on the use of the osmotic dilator Dilapan-S® in labor pre-induction in women with/ without Caesarean section in medical history

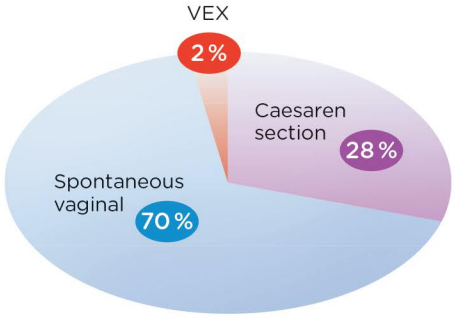
## Material and methods:

- The study was performed between May 2013 and October 2013 at 5 clinical centres.
- 96 women with singleton pregnancy after 36 week of gestation with head longitudinal position of the baby and Bishop score < 4 were included in the data analysis.
- 35 patients (36.5 %) had Caesarean section reported in their medical history.
- Assessment of the primary objective and success of cervical ripening procedure was based on the Bishop score. Safety data collection was focused on fetal hypoxia, uterine hypertonus, clinical signs of infection and other potential adverse effects related to the use of Dilapan-S®. In addition, patients' satisfaction was evaluated by personal patient questionnaire.

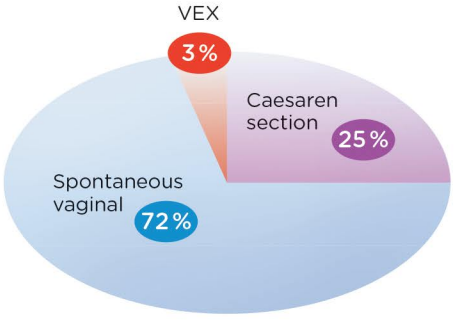
## Results:

- Average number of inserted dilators was 2 (range from 2 to 5).
- Bishop score increase (measured on the 10 point scale) was + 3,23 points (from 2.81 to 6.13). By 3.7 in group of women without previous C. section and by 2.7 in group of women with previous C. section, resp. (p-value) ≤ 0.003.
- Successful preinduction rate (Bishop score > 5): 86.5 %

| | All women | | Women with previous C. section | | Women without previous C. section | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| Bishop score ≥ 5 | 83 | 86.5 % | 29 | 82.7 % | 54 | 88.5 % |




Mode of delivery in all women (n = 95)

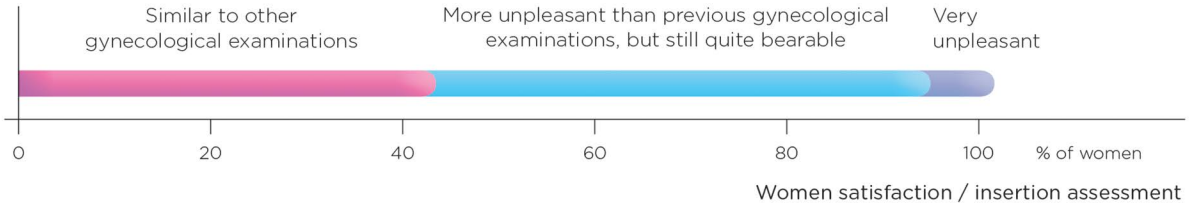



Mode of delivery in women without C. section in previous history (n = 61)

# Dilapan-S®

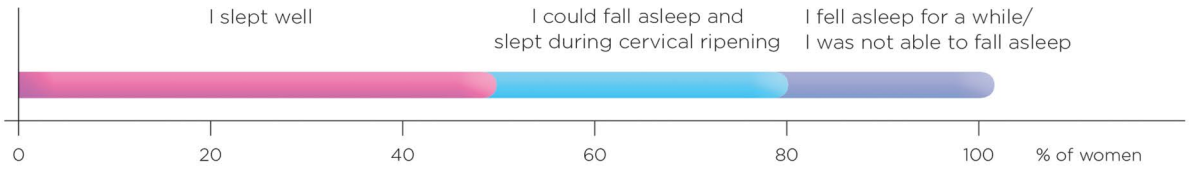
- Vaginal delivery rate: 71.6 % (75.4 % in women without previous C. section and 64.7 % in women with previous C. section, respectively
- The mean time of Dilapan-S® insertion was 16.99 hours (mainly overnight).
- Dilapan-S® extraction was assessed by physicians as easy in 100 %.
- No fetal hypoxia at CTG trace during preinduction.
- Uterine contractions measured by CTG occured in 30 females (31.3 %).
- No uterine hyperactivity (> 5 contractions/10 minutes).
- Rupture of membranes associated with insertion of Dilapan-S® was not reported.
- No infectious complications related to Dilapan-S® use in mothers and newborns were reported.

93.7 % women evaluated Dilapan-S® insertion as fully acceptable




Women satisfaction / insertion assessment

Dilapan-S® allows 4 from 5 women to sleep during cervical ripening process




Women satisfaction / opportunity to sleep during cervical ripening

## Conclusion:

- **High efficacy and safety, even in women with previous C. section, were confirmed.**
- **Low incidence of the uterine activity promotes patients' excellent satisfaction.**
- **The use of higher number of dilators improved clinical outcomes in terms of gain in Bishop score as well as in terms of achieving of vaginal births. Higher number of inserted dilators was not accompanied by more pain during insertion and did not affect ability to rest or sleep during preinduction.**
- **Achieving shorter preinduction time was not among the objectives of this study, but from the presented impact of the number of dilators on Bishop score can be assumed that higher number of dilators could potentially lead to shortening of the preinduction time.**

**References: 1.** Hruban L et al: Effectiveness and safety of the osmotic dilator Dilapan-S® for cervical ripening in females with/without C. section in medical history. Poster presentation. XXIV. European Congress of Perinatal Medicine, June 104, Florence, Italy
**2.** Zahumensky J et al: The impact of the number of pieces of osmotic dilator Dilapan-S® used for cervical ripening on the course and outcome of labor. Poster presentation, 13rd World Congress in Fetal Medicine, June-July 2014, Nice, France **3.** Vlk R et al: Efficacy and safety of the osmotic dilator Dilapan-S® for cervical ripening in women with/without C. section. Poster presentation. 13rd World Congress in Fetal Medicine, June-July 2014, Nice, France

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# Prospective clinical study comparing Dilapan-S® with $PGE_2$ gel and Estradiol gel

## Material and methods:

- 247 patients were randomized to one of the following preinduction protocols:
  - four hygroscopic dilators (Dilapan-S®) applied intracervically (n = 82) for 14 hours
  - 0.5 mg of Prostaglandin E2 gel (Prepidil gel) administered intracervically (n = 83)
  - 150 mg of Estradiol gel administered intravaginally (n = 82)

## Results:

- Average Bishop score increase (measured on the 10 point scale).
  - Dilapan-S®: 3.9
  - $PGE_2$ gel: 3.7
  - Estradiol gel: 2.8


- Vaginal delivery rate in Dilapan-S® group: 80.5 %.

| | Successful preinduction rate | Labor induced by preinduction alone | Induction to delivery interval | Caesarean section rate |
|---|---|---|---|---|
| Dilapan-S® | 89 % | 20.7 % | 7 hrs 49 m | 19.5 % |
| $PGE_2$ gel | 85 % | 31.3 % | 7 hrs 27 m | 24.4 % |
| Estradiol gel | 76.8 % | 17.1 % | 9 hrs 15 m | 24.4 % |

- Neither serious side effects nor negative neonatal outcome were noted in either group, incl. infectious complications.

# Dilapan-S®

## Conclusion:

- Dilapan-S® rods and $PGE_2$ gel proved as similarly efficient in cervical ripening and with higher efficacy in comparison with Estradiol gel.
- Induction to delivery interval was shorter in the $PGE_2$ gel and the Dilapan-S® groups.
- The Dilapan-S® group had the lowest Caesarean section rate.
- All cervical ripening methods were evaluated as safe.
- The labor and delivery should preferably take place during the daytime for high-risk patients. From this point of view, Dilapan-S® seems more appropriate for preinduction of high-risk pregnancies.
- Safety profile of Dilapan-S® suggests the product might be appropriate for out-patient cervical ripening for low-risk patients.

**Reference:** Roztocil A et al.: A comparison of three preinduction cervical priming methods: Prostaglandines E2 gel, Dilapan-S® rods and Estradiol gel. CZ Gynecol. 63, 1998, č. 1, str. 3–9

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# International observational e-registry on the use of Dilapan-S® osmotic dilator for cervical ripening prior to labor induction

## Material and methods:

- Prospective observational international multicentric e-registry performed between May 2015 and April 2017.
- The main objective is to monitor clinical outcomes of the use of Dilapan-S®
  1) for cervical ripening and following procedures of induction of labor with the main focus on the duration of cervical ripening, overall duration of induced labour procedure and the rate of vaginal deliveries within 24 hours; estimated total sample size 600 women (IOL)
  2) for cervical priming prior to termination of pregnancy with regard to the number of dilators used and duration of insertion of dilators *in situ;* estimated total sample size 520 women (TOP)

## Project overview:

- 21 study sites / 8 countries (UK, Germany, USA, Czech Republic, Slovakia, India, France, Russia)
- Chief investigator: Prof. Janesh Gupta, MSc, MD, FRCOG, Birmingham Women's Hospital, Birmingham, UK
- Electronic data collection, continuous remote data monitoring
- 348 patients already recruited in Jan 2016 (250 in IOL and 98 in TOP)

**2015**
- 14 sites currently recruiting
- 2 sites are ready to start
- 5 expecting EC approval

**2016**
- Initiation of 100% of study sites
- Interim data reports
- Presentation of interim results

**2017 +**
- Closing of data records
- Final study reports
- Publication and presentations of complete clinical results

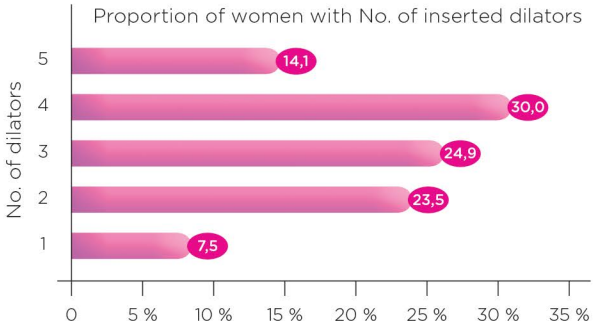
214 women from 6 study sites in 5 countries were included in the 1st interim IOL data analysis.

| Country | Study site involved into the analysis | | No of Patient enroled |
|---|---|---|---|
| UK | Birmingham Women's Hospital, Birmingham | *Prof. Janesh Gupta, MSc, MD, FRCOG* | 40 |
| Germany | Klinikum im Friedrichshain Vivantes, Berlin | *Ass. Prof. Lars Hellmeyer, MD* | 70 |
| Czech Republic | Masaryk University Hospital Brno | *Petr Janku, MD, PhD* | 39 |
| Slovakia | University Hospital Trnava | *Ass. Prof. Jozef Zahumensky, PhD* | 37 |
| India | UCMS Guru Teg Bahadur Hospital, New Delhi<br>Sri Ramachandra Medical College, Chennai | *Prof. Amita Suneja, MD, FWHO*<br>*Prof. Usha Vishwanath, MD* | 28 |
| Total | 6 | | 214 |

# Dilapan-S®

## Results:

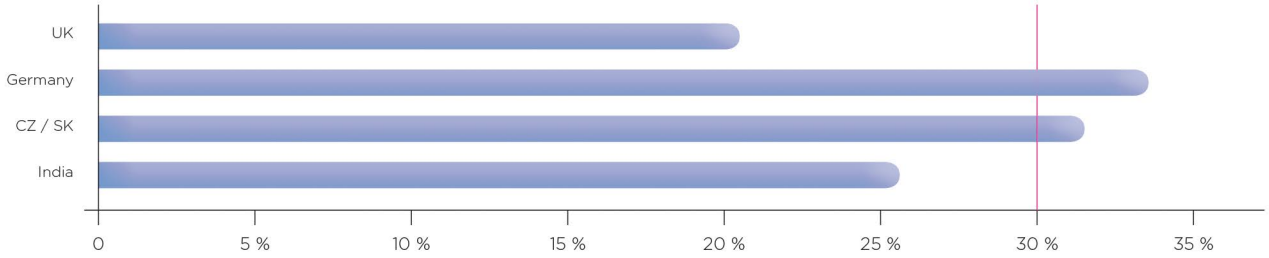
- Number of inserted dilators varied from one to five pieces.




- The average increase of Bishop score was +3,72 (measured on the 13 point scale).

| All women | N | Mean | 95 % CI |
|---|---|---|---|
| Bishop score prior to insertion | 214 | 2.836 | 2.656 to 3.017 |
| Bishop score after extraction | 214 | 6.552 | 6.299 to 6.805 |
| **Women without previous C. section** | **N** | **Mean** | **95 % CI** |
| Bishop score prior to insertion | 186 | 2.887 | 2.694 to 3.080 |
| Bishop score after extraction | 186 | 6.582 | 6.310 to 6.853 |
| **Women with previous C. section** | **N** | **Mean** | **95 % CI** |
| Bishop score prior to insertion | 28 | 2.5 | 1.988 to 3.012 |
| Bishop score after extraction | 28 | 6.357 | 5.617 to 7.097 |

- Average Caesarean section rate was 30.4 % and differs from 20 % to 33 % in relation to each study site.




- 11.2 % of women delivered vaginally with no further induction method.
- No uterine hyperstimulation and no foetal pathology was reported based on CTG during cervical ripening.
- 10.3 % of patients experienced uterine contractions while the dilator was inserted.
- 8.3 % of women reported complications or discomfort during preinduction.
- Maternal infectious complications were observed in 5 cases (2.3 %). No association of maternal infection with the use of osmotic dilator was reported.
- No neonatal infectious complication was reported.

## Conclusion:

- **Application of Dilapan-S® is a safe and efficient technique of cervical ripening.**
- **Dilapan-S® can contribute to the achievement of high vaginal delivery rate.**
- **No serious adverse outcome for mother and newborn reported.**
- **Low occurence of uterine contractions during cervical ripening.**
- **Potential to prevent unnecessary Caesarean sections in high-risk patients.**
- **The application of Dilapan-S® can be an outpatient procedure in low-risk patients and therefore cost-effective.**

**References:** **1.** Gupta JK et al. Mechanical methods of cervical ripening. Oral presentation at All India Congress of Obstetrics & Gynaecology 2016, Agra, India 13–17 January 2016 **2.** Data on file

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