Mode of Delivery and Pregnancy Outcome in a Tertiary Center for Adult Congenital Heart Disease

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Pregnancy policy of the Adult Congenital Heart Unit, Rabin Medical Center

1. Pre conception consultation very desirable
2. Correct important problems that may impact on safety and success of pregnancy.
3. Use biological valves for valve replacement
4. Improve hemodynamic burden by pharmacological treatment starting II trimester
5. Advocate strongly against pregnancy in Eisenmenger, severe PHT, very cyanotic patients and myocardial dysfunction.

Low risk patients

- Patients with simple treated or untreated malformations without hemodynamic or clinical consequences
- Usually one visit to the clinic during pregnancy, including echocardiography
- Fetal echocardiography – around 20 wks. gestation
- No need to refer to high risk pregnancy unit
- No recommendations regarding mode of delivery

Moderate and high risk patients

- Report pregnancy as soon as possible, receive instructions for stopping/changing medication (warfarin, ACE inhibitors)
- Regular visits to clinic as required. At wk 15, clinical deterioration may be already apparent and termination still feasible
- Visit wk. 32-34 for last assessment before delivery. Letter to high risk pregnancy unit with detailed instructions.
- In most cases, advocating induction of labor at 37/38 wks.
- Post delivery, in very high risk patients, cardiac intensive care unit for 24 hours

Eisenmenger syndrome or severe pht

- Maximal medical treatment including iv prostanoids
- Elective CS around wk. 32-34
- Prolonged hospital stay in intensive care unit (at least 10-14 days)
- However, pregnancy itself is usually well tolerated even without iv drugs
- Clinical deterioration and death usually occur later, several days and even one to two wks. post delivery, for unexplained reasons, despite all above measures

Planned Induction of labor

- Suitable for patients living far away
- Patient is admitted to high risk pregnancy unit
- All relevant staff have time to assess the patient and the recommendations of the cardiologist
- Delivery is planned to take place during weekdays and working hours, when the most senior staff can handle it.
- Not much in the literature regarding planned induction of labor for cardiac indications

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Pregnancy outcome in women with heart disease undergoing induction of labour

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Objective To examine the safety and outcome of induction of labour in women with heart disease.

Design Prospective single-centre comparative study.

Setting Major university-based medical centre.

Population/Sample One hundred and twenty-one pregnant women with heart disease.

Methods The sample included all women with acquired or congenital heart disease who attended our High-Risk Pregnancy Outpatient Clinic from 1995 to 2001. The files were reviewed for baseline data, cardiac and obstetric history, course of pregnancy and induction of labour and outcome of pregnancy. Findings were compared between women who underwent induction of labour and those who did not. Forty-seven healthy women in whom labour was induced for obstetric reasons served as controls.

Main outcome measures Pregnancy outcome.

Results Of the 121 women with heart disease, 47 (39%) underwent induction of labour. There was no difference in the caesarean delivery rate after induction of labour between the women with heart disease (21%) and the healthy controls (19%). Although the women with heart disease had a higher rate of maternal and neonatal complications than controls (17% *vs* 2%, $P = 0.015$), within the study group, there was no difference in complication rate between the patients who did and did not undergo induction of labour.

Conclusion Induction of labour is a relatively safe procedure in women with cardiac disease. It is not associated with a higher rate of caesarean delivery than in healthy women undergoing induction of labour for obstetric indications, or with more maternal and neonatal complications than in women with a milder form of cardiac disease and spontaneous labour.

Possible disadvantages

- Patient may not be ready for delivery at 37/8 wks. gestation
- Labor may be prolonged, increasing the chance of instrumental labor and urgent CS
- Compared to elective CS, urgent CS carries greater risk to mother and newborn
- For some patients – unnecessary interference with nature

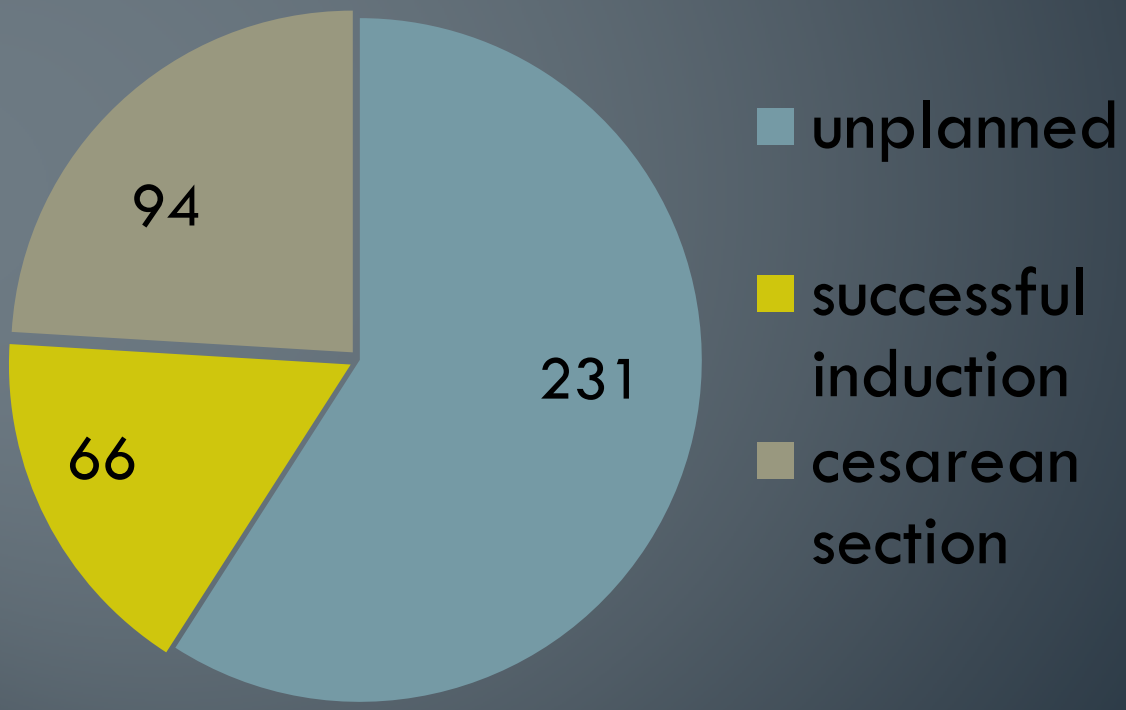
Current study

- 2000-2012
- Hospital database according to ICD 9 codes
- All deliveries with the diagnosis “congenital heart disease with delivery”
- Analysis of all other ICD 9 codes for the same delivery, including induction of labor, CS, complications, prematurity.
- Where needed, cross referenced the data with other sources, including the GUCH unit database

Results

- 391 deliveries
- Mean age at delivery was 30.3 (±5.5) years
- Age range 17.4-48.5 years
- One delivery each in 312 patients (during the study time period) including 4 twins
- 2 deliveries in 58
- 3 deliveries in 17 (including one with TGA post Senning atrial switch)
- 4 deliveries each in 4 women

Mode of delivery



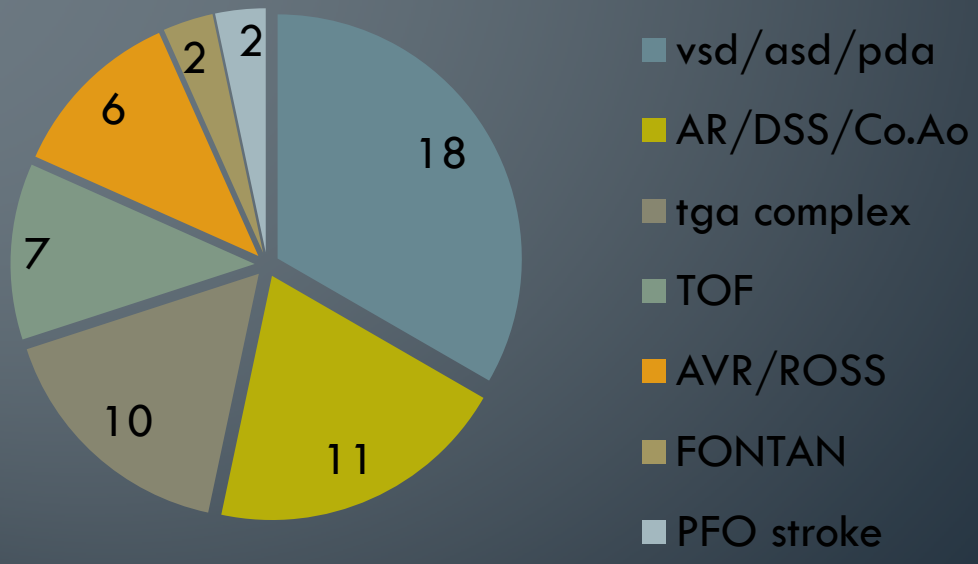
Unplanned Delivery

- Of 231 patients who delivered naturally
- 120 had an entirely smooth delivery
- The rest had at least one problem, mostly minor
- Laceration grade II or more, exploration of uterus
- 26 had premature rupture of membranes
- 23 with fetal distress
- 10 had hemorrhage requiring blood transfusion
- 3 rhythm problems in mother
- 30 vacuum and 6 forceps deliveries
- 21 had urgent CS

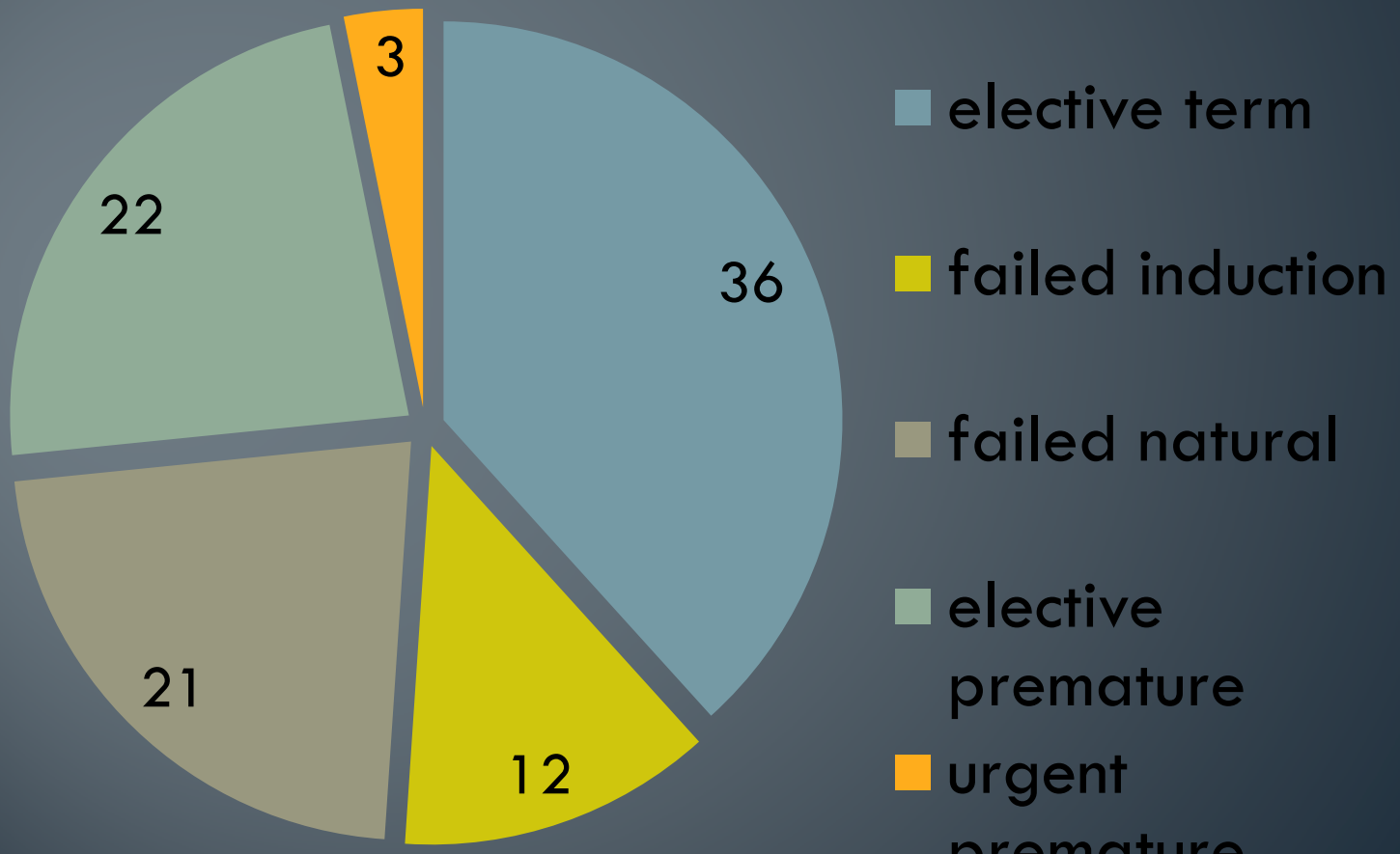
Induction of labor

- 78 patiens
- 66 had successful deliveries, 12 failed → CS
- 10 obstetric indication – pre-eclampsia, iugr etc.

Successful inductions – cardiac indications - 56 patients



Cesarean section – Total 94



Elective CS

- 58 patients
- 18 - breech presentation or pelvic disproportion
- 22 - previous CS
- 7 complex cardiac: 4 Eisenmenger, 2 PHT, one TGA- Rastelli, one Fontan
- 3 – twins
- Misc. – iugr, tia, birth canal infection, system. disease

Urgent CS

- 33 patients (12 post induction)
- 12 - fetal distress
- 10 – prolonged labor, failed instrumental delivery
- 3 pre-eclampsia
- 2 placental abruption
- 1 due to pulmonary edema (induction)
- 1 with DSS and hemodynamic crash (induction)
- 1 TOF with twins

Serious complications

- 2/4 Eisenmenger patients died in the 2nd post op. wk
- 1 patient with DSS who crashed post induction died
- 1 patient with sub-aortic stenosis and aortic regurgitation had uneventful delivery but died suddenly several days later at home
- 3 patients had dehiscence of CS suture
- 1 uterine rupture
- 1 pulmonary edema
- 2 systemic infections (one mech. ventilation)

Conclusions 1

- A large single center series of deliveries in CHD
- Outcome was very satisfactory except for Eisenmenger patients.
- Very low cardiac complication rate, despite many complex congenital patients
- Acceptable obstetric complication rate
- A higher than expected rate of CS

Conclusions 2

- It is not possible to draw conclusions regarding the impact of planned induction of labor.
- It is possible that in real life situation, CS may have been chosen more liberally in patients with a cardiologist's recommendation for planned induction of labor.
- In order to evaluate the policy of planned induction of labor, a prospective multi-center study should be planned.