

High order multiple pregnancies



Dr. Abha Majumdar
Centre of IVF and Human Reproduction
Sir Ganga Ram Hospital N. Delhi

Incidence

Multiple birth rate 29.1% *ART world report (1995):*

Twins 24.7%,

Triplets 4.1%, Quadruplets 0.2%

General population incidence:

Twins 1.1% (1-5%)

Triplets 0.012%

It is evident that, although a relatively small proportion of population undergoes infertility treatment, the increased risk of multiple gestation of this group has an impact on national multiple gestation rates.

Multiple pregnancy

- ❑ Increase in maternal morbidity and mortality.
- ❑ Risk to fetus is several fold
- ❑ Pre-term and very pre-term is major cause of neonatal mortality and morbidity
- ❑ Risk of life long neurological problems
- ❑ Rearing difficulties for parents
- ❑ Health services cost



Zygoty :

□ Monozygotic : splitting of one fertilized ovum during first 2 weeks of embryo genesis.

MZ twinning rate fairly constant 3-5/1000 birth

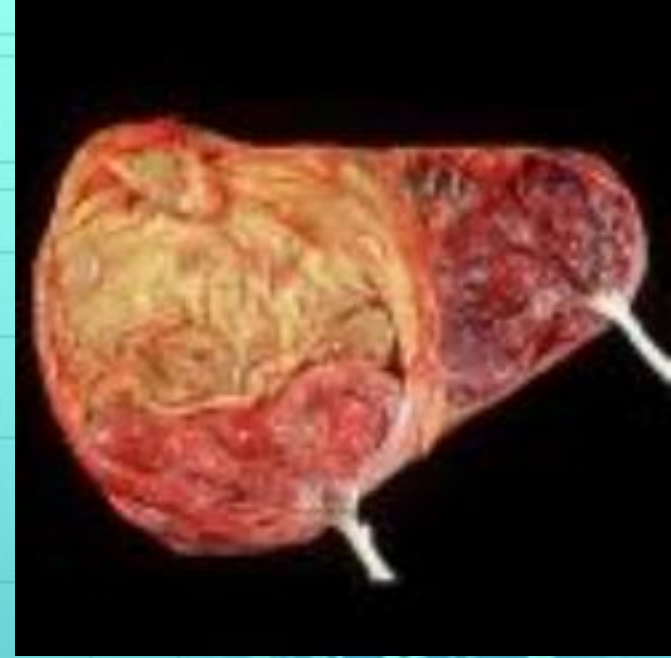
□ Dizygotic: 2 ova fertilized by 2 spermatozoa

DZ twinning affected by race, hereditary, maternal age and ovulation induction

Hellins law for higher order pregnancies:

1:89 twins, $1:89^2$ triplets, $1:89^3$ quadruplets

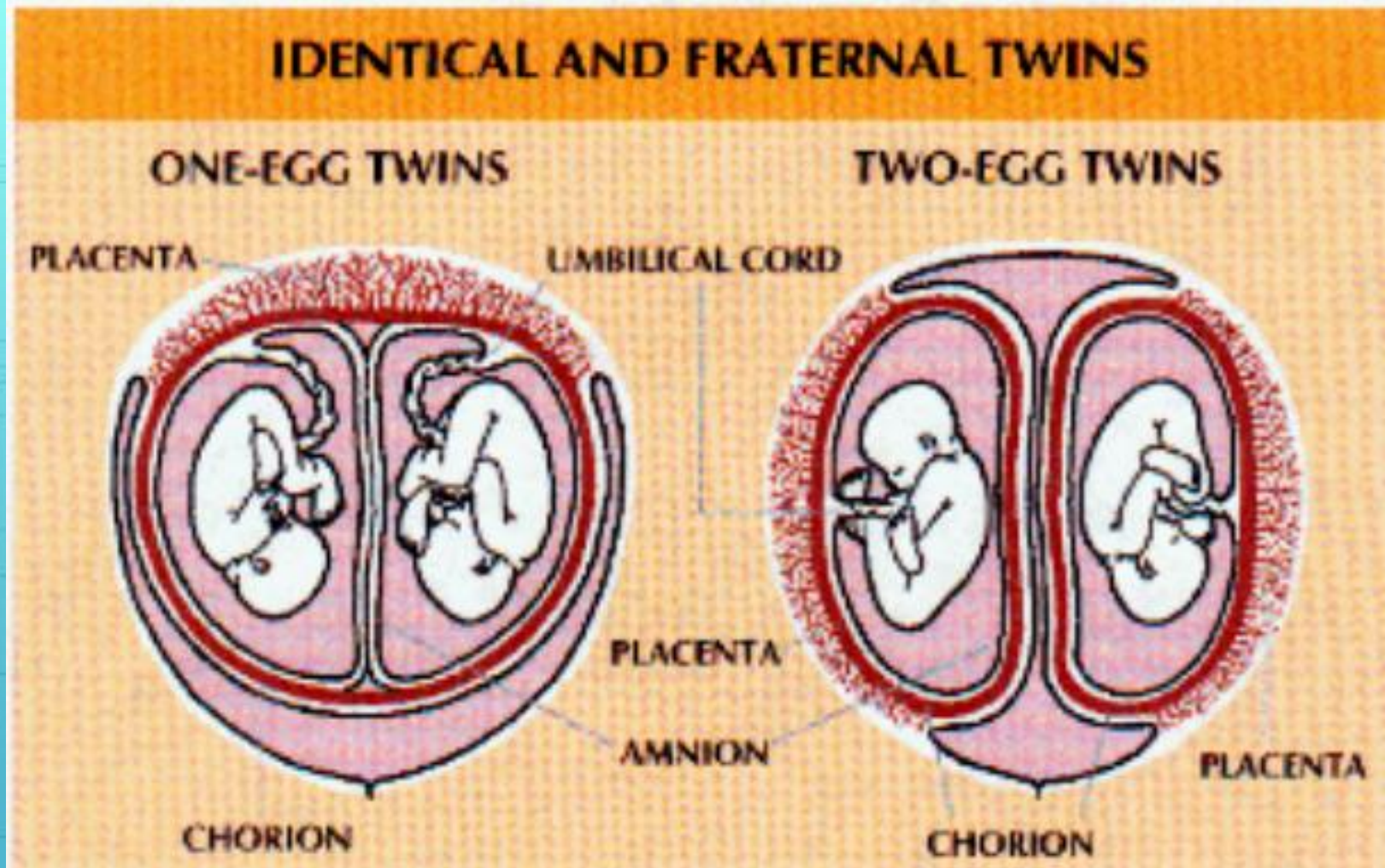
Chorionicity or Placentation



Dichorionic in 80% of twins, Can happen in MZ or DZ, separate or fused

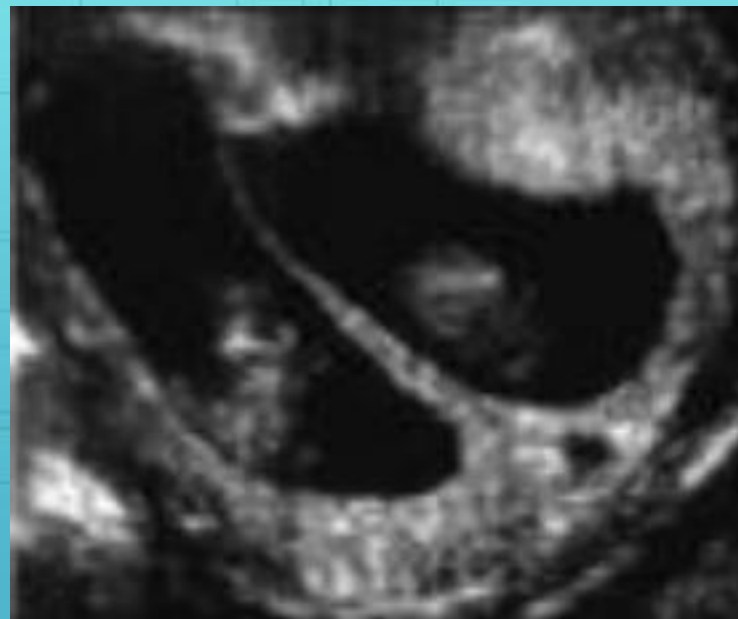
Monochorionic in 20% of twins, Only in MZ, can be monoamniotic or diamniotic

Zygosity and chorionicity



Diagnosis of chorionicity: 10 to 14 weeks.

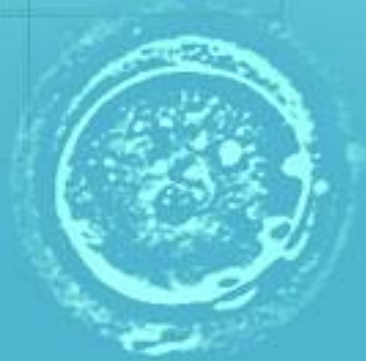
**Twin peak or lamda sign seen only in
dichorionic placenta. (99 to 100% accurate)**



Facts about multiple gestation

- Chorionicity rather than Zygosity determines fetal prognosis. MC twins are at higher risk than DC twins whether MZ or DZ
- Mortality higher in identical twins.
- Highest risk to twins before 24 weeks and of at least one twin loss. (12.7% of MC and 2.5% of DC).
- Triplets or higher order can have mixture of chorionicity.

Maternal mortality and morbidity



Maternal mortality

- Nigerian study 1985: 1% singleton, 2% for twin, and 6.3% for triplet pregnancies
- Europe 1994: three fold increase in maternal mortality rate (per 100000 live births) 14.9 and 5.2 respectively in multiple and singleton pregnancies.

Causes of maternal death:

- ☐ Eclampsia
- ☐ Excessive blood loss
- ☐ pulmonary edema with beta mimetic tocolysis

Maternal morbidity

- ☐ Spontaneous abortion, pre-term labour, PROM
- ☐ Gestational hypertension/pre-eclampsia
- ☐ Anemia, ante-partum post partum haemorrhage
- ☐ Gestational diabetes
- ☐ Fluid overload in association with tocolysis
- ☐ Long periods of bed rest & hospitalization
- ☐ Increase surgeries: Cerclage & Section
- ☐ Independent ↑ risk for ICU admission: OR 2.3

Hypertension

- Incidence OR: single 1.8 as compared to 3.4 in multiple gestation. *1995 Santema et al*
- Severe hypertension: 2 to 3 fold more in multiple pregnancy.
- Pre-eclampsia: 3 times more common, earlier onset, greater severity in multiple gestation. *1998 Clin Obstet Gynecol Senat et al.*
- Eclampsia: 6 fold increase in multiple gest. 28/10000 vs. 4.7/10 000 maternities *1994 Br Med J Douglas et al. 1198 Clin Obstet Gynecol Senat et al.*

Preterm Labour

- Gestational length inversely related to number of fetuses. *Capsi et al.1976;Br J Obstet & gynecol.*
- Tocolytics and antenatal steroids mostly used.
- Pulmonary edema as side effect of beta mimetic is more pronounced due to increase blood volume and cardiac output.

Anaemia & C.Section

- Iron, folate deficiency commonly seen in multiple pregnancy.
- Admission for bleeding 22% in MG as compared to 17% in SG (U.K.)
- Abruptio placentae and placenta praevia are common.
- Atony and PPH occurs with a risk of 3.0-4.5%.
- Higher incidence of CS due to malpresentation.
- Additional risk of endometritis and wound infections in C. section of MG vs. SG.

Maternal morbidity associated with triplet pregnancies

182 cases 5 published studies		recent study
■ Preterm labor	82%	76%
■ Pre-eclampsia	29%	27%
■ PROM	18%	20%
■ Anaemia	40%	27%
■ Endometritis	19%	26%
■ PPH	12%	9%
■ Gest diabetes		7%
■ HELLP(hemolysis↑, LFT↓, platelet		9%

Malone et al 1998. Am J Perinatal

Maternal complications in twin pregnancies

Follow up of 20 cases of twin deliveries

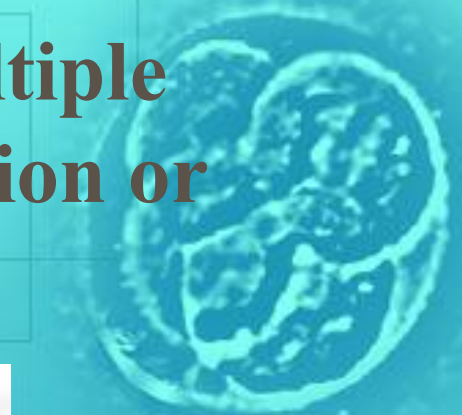
■ Preterm labor <34weeks	4	18.18%
■ Pre-eclampsia	4	18.18%
■ PROM	nil	
■ Anaemia	1	4.54%
■ PPH	nil	
■ Gest diabetes	3	13.59%
■ HELLP(hemolysis)	nil	

SGRH Unit of IVF and Human reproduction 2004

Fetal and neonatal outcome

- Congenital malformations are more, specially in MZ, MC twins. Cardiac, neural tube, brain, facial clefts & ant. abdomen wall defect.
- Chromosomal abnormalities with marginal increase in Down's syndrome.
- Discordance in birth weight(25- 35% in twin to triplets) with SGA occurs frequently.
- Twin to twin transfusion syndrome complicates 5 to 15% MC fetuses with vascular anastomosis.
- Neonatal morbidity due to higher rate of pre-term birth and its consequences.

No difference in outcome seen with respect to mode of conception: that is with spontaneously occurring multiple gestation or with ovulation induction or with IVF



Fetal reduction in high order pregnancies

expectantly managed triplets reduced twins

12 triplets

143 twins

Miscarriage rate

25%

6.2%

Average gest.

at delivery

32.9+/-4.7 weeks

35+/-3.1 weeks

Am J Obst. Gynecol 2001 APRIL 184(5),1040-1

Fetal reduction in high order pregnancies

Triplets reduced to twins	natural twins
12 cases	38
Miscarriage rate 1/12(8.3%)	7/38(18.2%)
<u>Gest 28-34weeks 4/12(33.3%)</u>	<u>5/31(16.21%)</u>
Gest > 34weeks 8/12(66.6%)	26/31(83.87%)

SGRH Unit of IVF and Human reproduction 2003-04

The world status today

Increase in incidence of MG due to increase in ART/IVF and ovulation induction.

20 fold increase in twin PR

400 fold increase in triplet PR

Martin & Welch 1998 Fertil Steril

2002 USA 36.2% multiple PR (SART, 2002)

2001 Europe 24% twins PR (Nyboe et al., 2005) eDET

Large observational studies demonstrated elective DET reduced triplet PR without compromising overall PR.

Templeton and Moris, 1998. N Engl J Med.

Cochrane review for number of embryos transferred after IVF

- PR with eDET elective double embryo transfer
OR 1.94, 95% CI 1.47-2.55

Vs

- PR with eSET +1FZET

Elective single embryo transfer +1 frozen thawed embryo transfer
OR 1.19, 95%CI 0.87-1.62

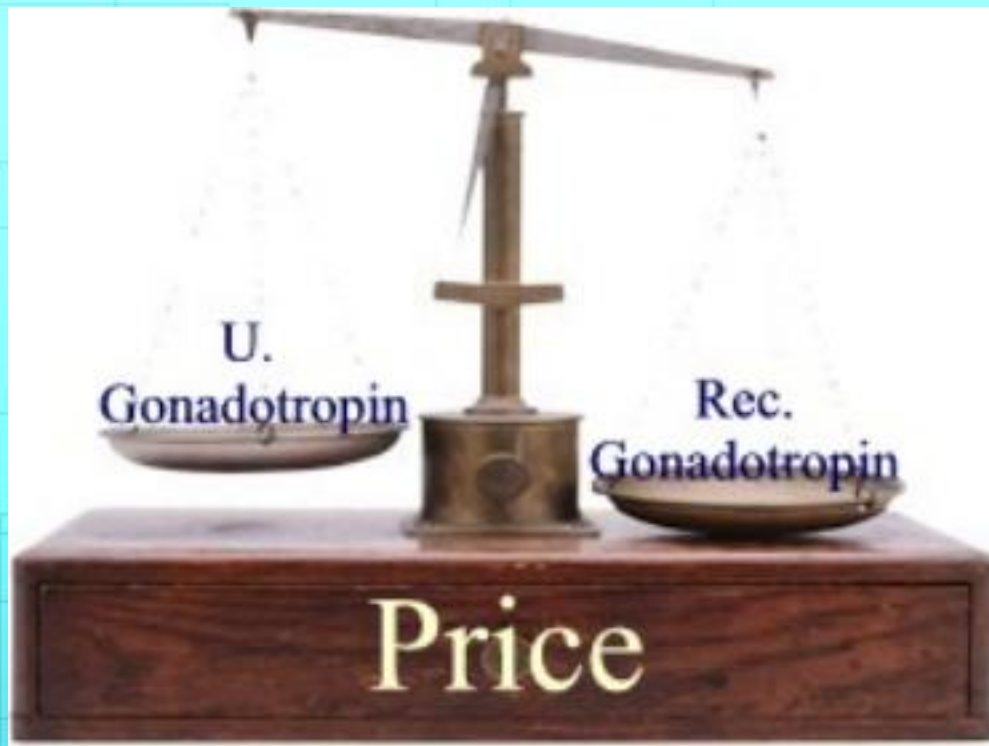
*Cochrane review: number of embryos transferred after IVF & ICSI
Pandian et al., Vol 20, No.10;Hum Reprod 2005*

The trend towards SET/DET

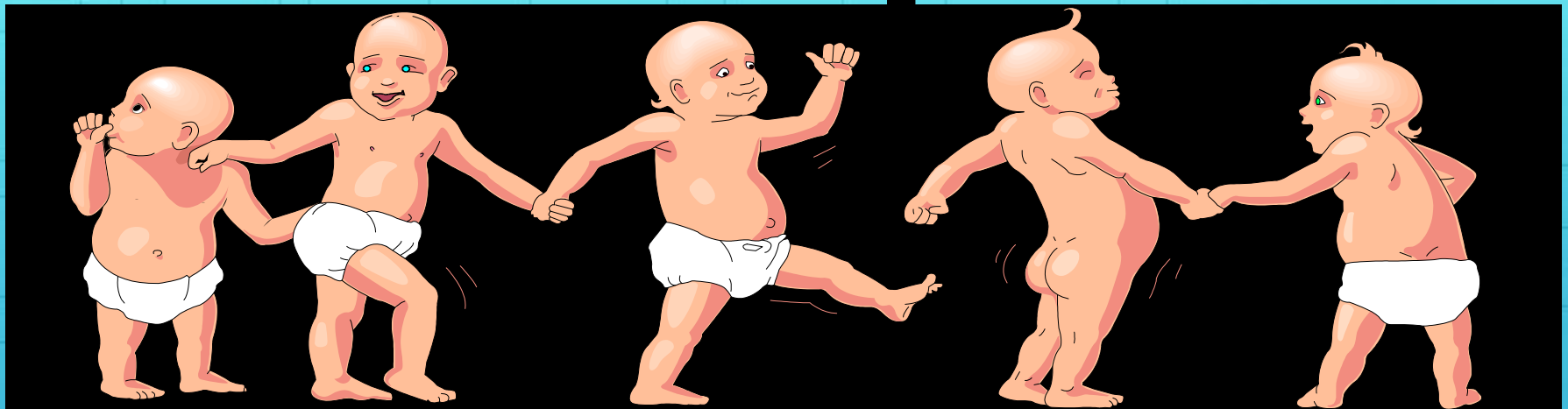
Single embryo or double embryo transfer is now framing legislative guide lines in most European countries to reduce maternal and fetal morbidity associated with high order pregnancies.

However such a policy has to be balanced against the risk of reducing the overall pregnancy rate in ART cycles keeping in mind the high cost involved.



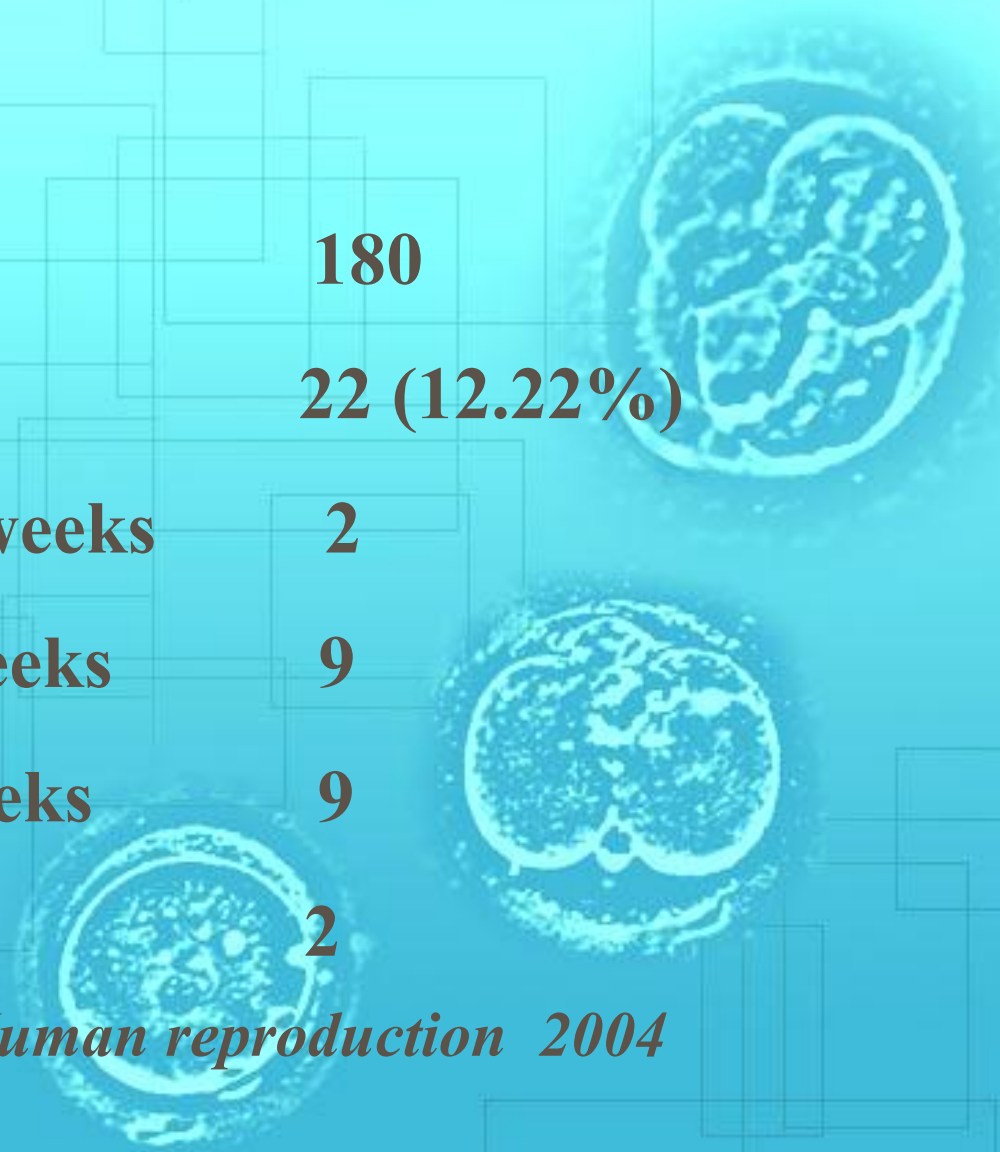


Thank You



JOY OF PARENTHOOD

Gestational age in twin pregnancies



Three ultrasound images of twin pregnancies are visible in the background. One is in the top right, and two are in the bottom right, showing different stages or views of the fetuses in the womb.

Total No. of deliveries	180
Total Twin deliveries	22 (12.22%)
Gestational age 28-34 weeks	2
34-36 weeks	9
>36 weeks	9
Lost to follow up	2

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Fetal and neonatal mortality rates

<u>England & Wales</u>	single	twins	triplets >
Still birth	4.4	14.2	19.3
Early neonatal	2.9	22.8	75.6
Late neonatal	0.8	3.9	10.6
<u>Sweden</u>			
Infant mortality	1	2.9	4-8.5